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THE EARTHQUAKE MECHANISMS OF THE BALKAN REGION

by

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PREFACE

This is the final report on the study of

The Earthquake Mechanisms of the Balkan Region

executed at the Royal Netherlands Meteorological Institute, at the request of UNESCO, and under contract no. 256.280 dated 6 January 1972, for the UNDP/UNESCO Project "Survey of the Seismicity of the Balkan Region".

The preliminary selection and treatment of basic data was performed to an important extent by Mr. G. Houtgast and other co-workers of the Geophysical Division of the Royal Netherlands Meteorological Institute. The Computer Department of the Institute took care of data sorting, listing and printing-out. The results are available on punched cards and on magnetic tape.

The work was directed by Dr. A.R. Ritsema, who is responsible for the interpretation of the data and results and for the writing of the report.

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January 1974

Dr. M.W.F. Schregardus
Director in Chief

A B S T R A C T

Compression and dilatation data of 702 earthquakes of the Balkan region have been investigated with a view on the determination of the focal mechanism. 256 shocks produced reasonably reliable solutions that can be used for an evaluation of the regional earthquake generating stress systems. The solutions were divided into four different groups:

- pressure type with reversed faults,
- tension type with normal faults;
- thrust type with thrust or vertical faults,
- transcurrent type with faults of the strike-slip kind.

Significant differences in distribution of these types with depth have been demonstrated: percentages of transcurrent and tension type earthquakes decrease with depth, those of pressure and thrust type increase with depth. For the region as a whole the direction of tectonic transport is in Northeast and Southwest azimuths.

Characteristics of the positions of stress axes in several sub-regions have been studied separately. Nearly always some sort of a pattern is clearly distinguishable. This shows that, although individual solutions may diverge widely in a given sub-region, for most of the solutions of a separate region a common base is available. This gives an indication of the position of the regional stress system.

From a mutual comparison of these stress fields in the region it is shown that the Balkan region can be divided into two parts each with its own stress regime:

1. The compressional stress regime stretches from the Alps in the North via the Dalmatian coast, Albania, Western and Southern Greece into the Aegean arc and up to the Southwestern tip of Anatolia. The deep earthquakes of the Aegean arc are included in this regime. Throughout the area the direction of compression generally is in Northeast - Southwest azimuths, in accordance with an interpretation as the zone of collision between the African and the European and Anatolian plates. The deep earthquakes of the Carpathian arc also belong to the regime.
2. The tensional regime comprises Western Anatolia, the Aegean basin including the inland side of the Aegean arc from Crete in the South through Greece, up to South Bulgaria in the North. This area is collapsing under tension.

Apparently the two regimes are rather independent from each other, but further study is needed for a more definite statement.

It is argued that the search for correlations of the individual solutions with the data of other geo-disciplines most fruitfully should be executed by local experts.

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INTRODUCTION AND PRESENTATION OF THE MATERIAL

1. Towards a comprehensive Catalogue of solutions

The study is based on the polarity of P and PKP wave data. No S wave and surface waves have been considered. The solutions are presented in the Catalogue annex to the report.

The nucleus of the Catalogue is formed by the solutions of European and in the present context of Balkan earthquakes, compiled in the framework of the former ESC Working Group on Earthquake Mechanisms, presently the Sub-Commission on Earthquake Mechanism and Earthquake Prediction, and presented at the General Assemblies of the European Seismological Commission of the years 1966 and 1970. This first compilation was extended with the more recent data on Balkan earthquakes from literature. Before inclusion in the Catalogue all these and former solutions were once more critically reviewed.

Independently, a study was made of a series of 36 shocks of the region of the years 1969-1972, using NOAA Seismogram filmcopies of the WWNSS and data from seismograms of selected stations in the region itself.

Thirdly and lastly, a great number of Balkan earthquakes of the last 15 years was investigated with the help of the compression/dilatation data enlisted in station bulletins, the bulletins of the BCIS, the ISS and ISC (July 1970 inclusive), the USCGS, NOAA and USGS (July 1973 inclusive), and the station readings especially made in answer to requests to certain individual stations of which the location was crucial with respect to the particular solution of the earthquake.

2. Explanation of the Catalogue

Column:

- 1- 6: Date: year, month and day.
- 7-14: Time: hour, minute, second to one-tenth of a second. An asterisk following the time means that the presented solution is non-unique, and that other possible solutions are given in the Catalogue.
- 15-19: Latitude to one-hundredth of a degree North.
- 20-25: Longitude to one-hundredth of a degree East.

- 26-28: Region number according to Flinn-Engdahl (see figure 1). This division with rectilinear boundaries has been chosen because of the ease of this system with respect to machine operations.
- 29-31: Depth in kilometers. A 9 in column 29 means that for the solution it is assumed that the focus is situated within the earth's crust with a longitudinal wave velocity of 6.25 km/sec. If in column 29 there is no 9, a velocity of 8.2 km/sec is assumed for the longitudinal wave in the focal region, irrespective of the sometimes less than 33 km depth figure given in columns 30 and 31. For depths greater than 33 km the appropriate velocity at that depth is used.
- 32-33: m_B to one-tenth of a unit. From the year 1963 onwards the values are those of the USCGS, NOAA and USGS preliminary determinations. Other data are from different sources. Use has been made of a pre-print of the catalogue of Balkan earthquakes 1901-1970 by Karnik. Not in all cases the difference between the values of m_B and those of M_s is clearly defined.
- 35-36: M_s to one-tenth of a unit. For the years up to 1955 magnitude values of Gutenberg & Richter (1954) and Karnik (1969) have been used, for the years up to 1965 the values of Rothé (1971). For more recent years values are from different sources, see also remark at m_B .
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- 41-45: Orientation of the A-axis or direction of fault motion (see also C-axis). The first three columns give the azimuth North through East in degrees, the last two the downward plunge in degrees. An asterisk following the last column means that the particular orientation has a high degree of certitude.
- 46-50: Orientation of the B-axis or "null vector" or line of intersection of the two nodal planes for longitudinal waves. For explanation see A-axis.

51-55: Orientation of the C-axis or the direction perpendicular to the fault plane. For explanation see A-axis.

Note that the A- and C-axes cannot be distinguished from P/PKP polarity data alone. In the Catalogue, arbitrarily, the choice has been made such that always the plunge of the A-axis is smaller than that of the C-axis.

56-60: Orientation of the P-axis or direction of greatest compressive stress assuming a homogeneous fault rock (angles of 45° with both A- and C-axes). For explanation see A-axis.

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66-67: Mechanism type, according to the following rules:

66: 0: P-type, the P-axis plunges at a smaller angle with the horizontal than the T-axis;

1: T-type, the T-axis plunges at a smaller angle with the horizontal than the P-axis;

2: =-type, the plunge of both P- and T-axes is equal.

67: 0: dip-slip fault motion, reversed fault, the plunge of the P-axis is smaller than that of the A-axis,

1: dip-slip fault motion, normal fault, the plunge of the T-axis is smaller than that of the A-axis;

2: dip-slip fault motion, thrust fault or vertical fault motion, the plunge of the A-axis is smaller than that of both P- and T-axes;

3: strike-slip, right lateral transcurrent or dextral fault;

4: strike-slip, left lateral transcurrent or sinistral fault.

An asterisk following column 67 means that the mechanism type is certain although the position of the main axes is not always known with sufficient accuracy.

68-72: The first three columns give the number of consistent P and PKP wave data, the last two that of the inconsistent data. When only the last two columns are occupied this means that they give the total number of compression and/or dilatation data together, and that the actual numbers of consistent and inconsistent data are unknown to the present author. A 9 in column 68 means that only a data-plot has been found in literature but that no station list of data is known.

- 73: Quality of the solution, according to the following rules:
- A: certain, possible variation of individual main axes less than 10° ;
 - B: reasonably good, at least one of the axes has been fixed with certainty (possible variation in position less than 10°), the orientation of the other axes, however, may vary up to 25° without influencing greatly the number of consistent and inconsistent readings;
 - C: tentative, possible variation in position of axes great without effecting the numbers of consistent and inconsistent data. The solution given, although the most likely, is certainly not the only possible one. Often only the mechanism type is fixed by the data;
 - D: poor, or no solution at all.
- Whenever in the text or figures solutions of C₁ quality are mentioned, it concerns those earthquakes of the C group that have at least 10 consistent initial motion data of P or PKP waves.

The Catalogue of solutions has been divided into three parts:

Part I gives the earthquakes with quality A and B solutions in order of chronology;

Part II gives the earthquakes with quality C and D solutions in chronological order, and

Part III gives the same data but now arranged in blocks of region numbers. The sequence in each block is at first the quality A and B shocks, followed by the quality C and D solutions, each group in chronological order.

RESULTS

3. The number and type of solutions

In total a number of 702 earthquakes of the region have been considered and taken up into the Catalogue. Of these a number of 86 or about 12% give a quality A solution. 170 earthquakes, or about 24%, produce a quality B solution. Together, the solutions of these earthquakes may be used for purposes of local and regional stress determinations.

For 218 additional earthquakes, or 31% of the total number, a solutions is given in the Catalogue based upon at least 10 consistent data. These are also indicated as quality C₁ solutions. The remaining part, 228 earthquakes or about 33% of the total number, is given only for the sake of completeness of the considered material. These latter two categories of solutions naturally are of limited value and only may be considered with all possible reserve and in conjunction with the solutions of other earthquakes of the same region.

4. Distribution in time

Table 1

Quality	A	B	C + D		totals
			C ₁	rest	
-1949	5	9	20	35	69
1950-1959	18	29	40	47	134
1960-1965	23	31	38	39	131
1966-1967	7	35	44	46	132
1968-1969	20	33	36	31	120
1970-1973,VII	13	33	40	30	116
Totals	86	170	218	228	702

Only about 10% of the considered shocks (69 out of 702) is of the years before 1950, and only around 5% of the quality A and B solutions (14 out of 256). In the periods 1950-1959 and 1960-1965 the average annual number of solutions of the quality A-B are respectively 5 and 9, and for the quality C-D respectively 9 and 13.

Since 1966 there is an annual average of 19 shocks with quality A-B solutions, and 30 shocks with a quality C-D solution. The percentage of earthquakes with a quality A or B solution over the total number of considered shocks for a given period seems to increase gradually from 20% in the pre-1950 years, via 35% in the period 1950-1959, to about 40% in later years.

5. Regional distribution of the solutions

Table 2

Region number	Number of earthquakes with a solution of quality				
	A	B	C + D		
			C ₁	rest	
358	12	10	14	13	Rumania
359					Bulgaria
363		1	2		Greece-Bulgaria border
364	7	21	26	38	Greece
365	5	9	13	13	Aegean Sea
366A	4	12	9	9	Turkey > 39½°N
366B	9	19	18	17	Turkey 38-39½°N
366C	7	11	9	12	Turkey < 38°N
368	3	14	15	18	Southern Greece
369	13	18	25	22	Dodecanese Isls.
370	10	20	31	37	Crete
371	1	2	7	7	Eastern Mediterranean
382		1	2	3	Adriatic Sea
383	4	11	8	13	Yugoslavia
391	1	6	14	7	Albania
392	4		10	1	Greece-Albania border
399	5	5	2	7	Ionian Sea
400	1	7	6	9	Mediterranean Sea
545	1	1	1		Northern Italy
546		1	5	2	Austria
549			1		Hungary
Total 702	86	170	218	228	Balkan region

Completeness and balance in the regional distribution, as shown in Table 2, has not yet been reached. Some regions are over-represented by the aftershocks of an heavy earthquake in this period as for example regions 366B, 364 and 369, or by the occurrence of many deep shocks to which extra attention was paid, such as region 358. Other regions such as 359 and 363 are under-represented by a lack of sufficiently large earthquakes in the period.

6. Distribution of earthquake mechanism types

Table 3

	compressional				tensional				neutral			
Mechanism type	00	02	03	04	11	12	13	14	22	23	24	Total
Numbers	54	33	18	15	51	29	19	13	11	7	6	256

The quality A and B solutions (Table 3) are symmetrically distributed with respect to the character of the main horizontal stress, the numbers of each corresponding compressional and tensional mechanism type are about equal. The different mechanism types are illustrated in the figure 2.

The material also has been divided into groups of reversed fault earthquakes (mechanism type 00), normal fault earthquakes (mechanism type 11), thrust fault earthquakes (mechanism types 02, 12 and 22), and transcurrent fault earthquakes (mechanism types 03, 04, 13, 14, 23 and 24). It appears that there are about 20% of the first two types earthquakes each, and about 30% of the latter two earthquake types each.

7. Type distribution in depth

Table 4

	P-type thrust	T-type	transcurrent		totals
crust (9)	13	25	39	57	134
sub-crust < 60 km	18	27	11	18	74
depth ≥ 60 km	23	21	1	3	48
totals	54	73	51	78	256

A conspicuous differentiation of mechanism types in depth seems to be valid (see figure 3). Transcurrent fault motions are the most common in crust earthquakes (about 42%). In depth they rapidly decrease in number. Tensional type earthquakes are three times more common in the crust than pressure type earthquakes. At depth this relation is just reversed with an overwhelming majority of P-type earthquakes. The number of thrust earthquakes is about equal in the three different depth ranges of Table 4, but the percentage is steadily increasing from 19% in the crust to 44% at depths greater than 60 km. More than 90% of the deepest earthquakes are of the P- and thrust type together, whereas in crustal earthquakes only 28% is of these types. The sub-crustal shocks shallower than 60 km are clearly intermediate between these two groups with 36% of the thrust type and 34, 16 and 34% of P-, T- and transcurrent type earthquakes respectively.

8. Type distribution in classes of magnitude

The earthquakes were divided into magnitude groups m_B to investigate the effect of magnitude on earthquake mechanism type. For the earthquakes for which only an M_s value is given a conversion factor was used to make an estimate of the equivalent m_B value. The relation

$$M_s = m_B + 0.6$$

was used, it is a good first approximation of the data for which both m_B and M_s are available.

Table 5

	P-type thrust	T-type	transcurrent	totals	
$m_B \geq 6$	4	4	4	10	22
$5\frac{1}{2} - 6$	7	16	14	14	51
$5 - 5\frac{1}{2}$	17	27	19	31	94
< 5	26	26	14	23	89
totals	54	73	51	78	256

The percentage of transcurrent shocks decreases in the lower magnitude groups, which is valid for all depth levels. There is also a tendency for increasing percentages of P-type mechanisms and decreasing percentages of T-type earthquakes with decreasing magnitude (see figure 4). The differences, however, are so slight that the data cannot be considered to be in favour of any supposed relationship between the magnitude of the shock and the mechanism type.

STRESS PATTERNS

9. General insight in the overall stress directions

The quality A and B solutions were divided into four groups:

- a. the P-type with the P-axis more or less horizontal, 00;
- b. the thrust type with the A-axis more or less horizontal, 02, 12 and 22;
- c. the T-type with the T-axis more or less horizontal, 11;
- d. the transcurrent type with both P- and T-axes about horizontal, 03, 04, 13, 14, 23 and 24.

For each of these groups a frequency diagram of the azimuth of the main horizontal axis (axes) was calculated. The 10° interval values were smoothed over an azimuth interval of 30° and plotted in the figures 5-8.

The P-axes of the 54 reversed fault earthquakes (figure 5) have a pronounced maximum around $N40^\circ E$ and a secondary maximum in the about $N120^\circ E$ direction. The major maximum for the greater part originates from the southwestern edge between the Aegean arc - Greece included - and the Ionian basin; the secondary maximum seems to be associated with the transcurrent motions of dextral kind such as occur in the about East-West directed North Anatolian fault zone.

The T-axes of the 51 normal fault earthquakes (figure 6) have a pronounced maximum in the about $N15^\circ E$ azimuth. It seems to be valid all through the region from Northwestern Greece to the Aegean Sea and well within the Anatolian part of Turkey.

The thrust motion direction (A-axis) of the 73 thrust (or vertical block motion) type earthquakes (figure 7) occur broadly in Northeast - Southwest azimuths, the minimum in the about $N115^\circ E$ direction is the more conspicuous. The broad maximum consists of two sub-maxima in directions of about $N15^\circ E$ and $N70^\circ E$ respectively. The maxima for the most important part are associated with under-thrusting motions of the Ionian Sea sector under the Aegean arc.

The azimuths of the P- and T-axes of the 78 earthquakes with a transcurrent fault solution (figure 8) are distributed rather evenly in all directions. There is a certainly not pronounced maximum of P directions in an azimuth of about $N105^\circ E$, and a

corresponding maximum of the T-axes in an about $N15^{\circ}E$ azimuth. These slight predominances are caused by the consistently dextral fault motions in the region of the North Anatolian fault zone.

From these four data-sets it can be concluded that in general the direction of tectonic transport in the region has an orientation in the Northeast - Southwest or/and Southwest - Northeast azimuths. For more details the data of the whole area have to be divided into regional sub-groups (next par.).

In figure 9 the location of the earthquakes with quality A and B solutions are given. P-, T- and =-types have been discriminated. P-types (horizontal pressures) occur preferably at the Southwest border of the seismic field, and T-types (horizontal tensions) within the area.

10. Regional stress patterns

For a determination of the regional orientation of stresses use has been made of composite plots of the P- and T-axes of the earthquakes of certain separate seismic regions within the area.

a. Carpathian arc, deep shocks only, region no. 358, figure 10.

25 P-axes out of the 31 considered earthquakes deeper than 60 km have an orientation within a cone of 45° around the direction $N270^{\circ}E$, dipping 5° , and only 1 T-axis is situated within the same cone. 28 of the available 31 T-axes fall within the 45° cone around the direction $N90^{\circ}E$, 85° , and only 3 P-axes have a similar orientation. It is clear that in this region a vertical extension of the deep earthquake zone is prevalent, combined with an about East-West directed horizontal compression.

b. Eastern Alps, no deep shocks, region 545, 546 and 549, figure 11.

Of the 10 considered earthquakes 8 P-axes are situated in the 45° cone around direction $N165^{\circ}E$, 15° . All T-axes except one are situated outside this cone.

Another possible system in the orientation of P- and T-axes of the region is a division in two quadrants with a compressional centre in $N5^{\circ}E$ direction for the P-axes and a tensional centre in $N95^{\circ}E$ direction for the T-axes. 9 out of 10 P-axes and all T-axes are in accordance with this distribution.

It may be concluded that in general the compressive stress has an about North-South azimuth the tensional stress is either dipping steeply or has an about East-West azimuth. In both cases the compressive stress in North-South azimuths may be considered as the principal agent causing the earthquakes.

- c. Dinarides of Yugoslavia and Albania, no deep shocks, region 382, 383, 391 and 392, figure 12.

The P-axes of 22 of the 27 quality A and B solutions have an orientation within a 45° cone around the direction $N215^\circ E, 15^\circ$, and only 3 T-axes are falling in the same category. The main earthquake-causing agent clearly is the compressive stress about perpendicular to the seismic and tectonic zone. The stress may either be relieved by underthrusting from the Southwest to the Northeast, equivalent to an overthrusting from Northeast to Southwest, or by faulting of the reversed or transcurrent kind.

- d. Western and Central Greece, all depths, region 399, 364, figure 13.

There are 40 earthquakes of all depths with quality A or B solutions in the region. The distribution of P- and T-axes is not simple in this case, but for a part conflicting. Most of the P-axes have an about Southwest or East azimuth, and most of the T-axes North or South. Tentatively, a quadrantal distribution of P- and T-axes is indicated in the figure, around $N266^\circ E, 3^\circ$ as the centre of the compressional quadrant and $N358^\circ E, 25^\circ$ as that of the T-axes. Of the 40 P-axes 27 are in accordance with this model, of the 40 T-axes 28. From the many inconsistencies it is clear that the earthquakes of this region are from different regimes. A more detailed study, also taking into account the precise location of the earthquakes and the local tectonic structural lines and other related evidence, could clarify the present picture.

- e. Southern Greece, all depths, region 400, 368, figure 14.

The greater part of the 25 earthquakes with a quality A or B solution certainly is of a common type. 22 of the 25 P-axes have an orientation within the quadrant of which the direction $N230^\circ E, 45^\circ$ is the centre, and for 21 of the 25 T-axes the same is true for the quadrant centered around $N50^\circ E, 45^\circ$. Moreover, within these quadrants there are local strong concentrations of axes: 18 P-axes are located inside the 45° cone around the direction $N205^\circ E, 45^\circ$, and 17 T-axes within the 33° cone around $N65^\circ E, 61^\circ$.

The average dip of the T-axis is $15-20^\circ$ larger than that of the average P-axis. The general type of motion indicated by these data is that of underthrusting of the Ionian Sea block under the Aegean arc along planes dipping at small angles of about 15° in Northeast direction, or overthrusting of the Aegean block in SW direction over the Ionian Sea region.

f. Region of Crete, all depths, region 370, figure 15.

27 of the available 30 P-axes of quality A and B solutions, and 26 of the 30 T-axes are in agreement with a quadrantal distribution of P- and T-axes around the direction $N215^\circ E, 40^\circ$ for the P-axes, and $N35^\circ E, 50^\circ$ for the T-axes. Moreover, 24 of the 30 P-axes are situated within the 45° cone around the direction $N210^\circ E, 45^\circ$. Again, the general type of motion indicated by these data is that of under- or overthrusting fault motions in identical azimuths as found in the Southern Greece region. Contrary to the already treated regions, in this salient the direction of main stress components and fault motion is not directed perpendicular to the local seismic and tectonic trends but clearly oblique. The agreement of the direction of transport with that of Southern Greece and with that of the supposed drift direction of the Anatolian sub-block (see later) points to an interconnection between these movements.

g. Aegean arc, deep shocks only, region 364, 368, 369, 370, fig. 16.

There are 40 earthquakes of all quality classes. 31 P-axes of the 40 solutions have an orientation within the 50° cone around the direction $N210^\circ E, 15^\circ$, and only 4 of the 40 T-axes are not outside this cone. 26 of the 40 T-axes, moreover, dip steeply within the 45° cone around $N30^\circ E, 80^\circ$. Again, this points to underthrusting motions of the Ionian block or overthrust motions of the Aegean block in Northeast or Southwest direction respectively. That also in depth these types of motions prevail suggests a connection with the frontal part of the African plate plunging under the Aegean arc.

h. Dodecanese Islands region, all depths, region 369, figure 17.

There is some similarity in the distribution of the 32 P- and T-axes of quality A and B solutions with that of region 364. Again, the quadrantal distribution seems to be the most acceptable, in this case around $N27^\circ E, 2^\circ$ for the P-axes and around $N296^\circ E, 16^\circ$ for the T-axes. 28 of the 32 P-axes and 27 of the 32 T-axes are in

confirmation with this model. There is an additional higher concentration of T-axes in the 45° cone around $N300^\circ E$, 45° of 21 out of 32. Whereas, in comparison with regions 370 and 368, the general azimuth of the P-axes has remained the same, the direction of the T-axes has shifted through an angle of more or less 90° . It seems as if the general direction of the T-axes is determined by the location of the Aegean basin with respect to that of the particular earthquakes. The direction of the P-axes on the contrary seems to be independent of the trend of the local arc structure and to be determined only by the relative motion direction of the African plate and the Anatolian sub-plate. The result of these conflicting regimes is that transcurrent motions prevail but that all other types of mechanisms are possible and in effect do occur in the region without strongly violating the general rules indicated here.

- i. Western Turkey, South of $38^\circ N$, no deep shocks, region 366C, figure 18.

19 T-axes of the total of 27 earthquakes with solutions of all quality are located within the 50° cone around the direction $N295^\circ E$, 15° . Only 2 of 27 P-axes are not outside this cone. The general direction of the T-axes corresponds with that of the T-axes of the adjacent region of the Dodecanese Islands. Like in the case of regions 364 and 369, however, there are several exceptional T-axes with directions quite unlike the general trend, indicating complications in the stress field of the region.

- j. Western Turkey, $38-39\frac{1}{2}^\circ N$, no deep shocks, region 366B, figure 19.

There are 45 earthquakes with solutions that have been used. The composite plot shows that 39 of the 45 T-axes are oriented inside a 45° cone around $N20^\circ E$, 0° direction, and only 2 of the 45 P-axes are not outside this same cone. It is clear that an horizontal extension of the region in NNE-SSW direction is prevalent. More than $2/3$ of the shocks are of the normal fault type with steeply dipping P-axes. It is remarkable that at such small distances as region 366C is situated, the general direction of stresses differs so abruptly and significantly. The stress configuration, with respect to that in region 366C, has rotated over an angle of about 90° .

- k. Western Turkey, North of $39\frac{1}{2}^{\circ}$ N, no deep shocks, region 366A, figure 20.

In comparison with the adjacent region 366B the general azimuths of the P- and T-axes have remained the same. In this region, however, it are apparently the P-axes that have the most close location. 21 of the 25 P-axes of considered earthquakes have an orientation within the 45° cone around the $N110^{\circ}E, 30^{\circ}$ direction, and none of the 25 T-axes has an anomalous orientation with respect to these. When considered in the quadrantal mode, there are 23 of the 25 P-axes inside the P quadrant centered around the $N102^{\circ}E, 14^{\circ}$ direction and 24 out of the 25 T-axes inside the remaining quadrant centered around the $N8^{\circ}E, 14^{\circ}$ direction. It is clear that transcurrent fault motions prevail and that they confirm the dextral motions along the North Anatolian fault zone. Although the region is under tension directed about North-South, the main earthquake generating agent seems to be the pressure exerted by the Westward moving Anatolian block relative to the region in the North.

- l. North Aegean Sea and South Bulgaria, no deep shocks, region 363, 365, figure 21.

There is a clear preference for about North-South tensions in the region. 21 of the 33 T-axes of mechanism solutions of all qualities are situated within the 45° cone around the $N170^{\circ}E, 0^{\circ}$ direction. Only 3 of the 33 P-axes have an orientation not outside this cone. If only quality A and B solutions are considered the score amounts to 13 out of 16 T-axes and 15 out of 16 P-axes. It is clear that the region is subject to an about North-South directed tensional stress.

11. The maps of generalized stress patterns

The main stress component for a sub-region is defined as the one which in the composite stress diagram shows the greater concentration in orientation. In this sense, and as a summary of the regional treatment, the following stresses prevail in the sub-regions (see Table 6):

In figure 22 the regional stress directions of P and T as determined from the composite plots for the sub-regions are summarized. Some remarks can be made:

In the whole zone from the Northern Dinarides in Yugoslavia through Greece, Crete to in the Dodecanese salient of the arc compressive stress is directed in about SW-NE azimuths. The dip of the Pressure axis is mostly slightly to the outside of the arc, i.e. to the Southwest. In the Eastern Alps and the Carpathian arc too the Pressure stress is horizontal and directed more or less perpendicular or slightly oblique to the local trend of the mountain ranges.

In the region from the Dodecanese Islands through Turkey and Aegean Sea, South Bulgaria and Central Greece horizontal tensions seem to prevail, mostly in about North-South azimuths. Exceptional directions are found in Southern Turkey and adjacent region 369 where an abrupt change to WNW-ESE azimuths is apparent.

If the individual P- and T-axes of the separate earthquakes are considered, something can be said about the changes in position of the stress field within the sub-regions and in between the different provinces. In the figure 23 the main horizontal stress axes directions have been plotted for respectively the quality A, quality B and the quality C + D shocks. Deep earthquakes of the region have been treated separately.

Although the deviations of individual solutions sometimes are great, also here the general trend found in the composite plots can be traced. Moreover, it is possible now to sketch in more detail the local trend of the compressive and tensional stresses. This has been done in two steps. At first the map was constructed of the general direction of compressive stress in the region as derived from the data of the figure 23. Continuity of directions throughout the area and in between the sub-regions was pursued. Figure 24 gives the general picture of the compressive stress field in the region. In the outlined area P-axes normally have a more horizontal position than T-axes which means that within the area the compressive stress is the main agent in the generation of earthquakes. The deep earthquakes of both the Carpathian and the Aegean arcs are included in the field because they are of this particular type. Where the outline of the field is not well defined by lack of earthquake mechanism solutions this is indicated by a dotted line.

Table 6

Region no.	Flinn/Engdahl	depth km	P *)	score *)	T *)	score *)
Carpathian arc	358	> 60	N270°E, 5°	25-31	N 90°E, 85°	28-31
Eastern Alps	545,546,549	< 60	N165 E,15 N 5 E, 0	8-10	N 95 E, 0	10-10
Dinarides	382,383,391,392	< 60	N215 E,15	22-27	(N358 E,25)	28-40
Western Greece	364,399	all	(N266 E, 3)	27-40	N 65 E,61	17-25
Southern Greece	368,400	all	N205 E,45 N230 E,45	18-25	N 50 E,45	21-25
Crete	370	all	N215 E,40 N210 E,45	27-30	N 35 E,50	26-30
Aegean arc	364,368,369,370	> 60	N210 E,15	31-40		
Dodecanese Isls	369	all	N 27 E, 2	28-32	N296 E,16	27-32
Western < 38°N	366C	< 60			N300 E,45	21-32
38-39½°N	366B	< 60			N295 E,15	19-27
Turkey > 39½°N	366A	< 60	N110 E,30	21-25	N 20 E, 0	39-48
Aegean Sea, Bulgaria	363,365	< 60	N102 E,14	23-25	N 8 E,14	24-25
					N170 E, 0	21-33

*) P = the centre of the compressional stress cone or quadrant;

T = the centre of the tensional stress cone or quadrant;

"score" gives the number of earthquakes for which the individual axis has a position that is in conformance with the central direction indicated in the column before, followed by the total number of earthquakes used for that particular region.

The compressional stress field seems to be continuous throughout the region with the only exception in the Southern part of Western Anatolia where the stress lines have an orientation that suggests a singularity.

In the same way the map of the general trend of tensional stress in the region was constructed from the data of figure 23. The result is shown in figure 25. Within the enclosed area the tensional stress has the most horizontal position, and consequently it is considered the main earthquake generating agent in the region. It is seen that within the Aegean basin itself there is a region devoid of any major earthquake. The tensional stresses always seem more or less directed towards the centre of this area. Singularities in the tensional stress field do occur in Southern Turkey exactly in the zone where also the compressional stress field changed trend abruptly, and in Central Greece (region 364) where the composite plot of P- and T-axes already suggested complications of some kind.

A comparison of the last two figures shows that in the greater part of the Balkan region the direction of the main compressional and tensional stresses are about perpendicular to each other. A notable exception occurs in the Southern Greece area where both stresses have about the same azimuth and which - consequently - is characterized by a great percentage of thrust type earthquake mechanisms (9 out of 17 of quality A and B).

Figure 26 is a combination of the two former figures and summarizes the general lines of the earthquake mechanisms of the region as deduced from the data of the Catalogue and as discussed in the foregoing tables and figures. The two main sub-regions have clearly been distinguished, the one under horizontal tension and the other one under horizontal pressure.

I. The region of predominant pressures in a horizontal sense stretches from the Alps in the North all along the Dalmatian coast of Yugoslavia and Albania, Western Greece and along the Cretian arc into the Southwestern tip of Anatolia. Under Western and Southern Greece and the Southern part of the Aegean Sea this area of horizontal pressures extends in depth all along the zone of mantle earthquakes with depths equal or greater than 60 km.

In general the orientation of the pressure stress is about North-east - Southwest. That means that it is about perpendicular to the structural lines of Dinarides and Hellenides, but oblique and even parallel to the structural trends in the South and Southeastern sectors of the Aegean system. In the Yugoslavian, Albanian and Western Greece sectors the tensional stress too, often has an about horizontal position, giving rise to transcurrent fault motions. In the South the tensional stresses mostly are steeply dipping, resulting in thrust and reversed faulting.

The Pressure regime coincides with the collision zone between the European and the African plates. Its downward extension in the zone of deep earthquakes of the Aegean arc marks the downward plunging frontal part of the African plate. The zone coincides with an arc of uplift at the earth's surface for at least the past several million years. The young tectonic structures and recent crustal movements in the region, for so far known, are not in contradiction with such a type of stress field.

A second province of mainly horizontal pressures is the pocket of mantle earthquakes in the Carpathian arc of Rumania. The azimuth of the pressure stress has an about East-West direction, also in this case thus not exactly perpendicular to the local structural lines.

II. The region of predominant tensions in a horizontal sense extends all over Western Turkey and the Aegean Sea from South Bulgaria and Yugoslavia in the North to the mainland of Greece and the innerpart of the Aegean arc and Crete in the South. It is the region of the crustal segment of the Aegean basin sensu lato. In general the azimuth of the tensional stress is in Northerly directions from Northeast in the East over North to Northwest in the West. There is a clear tendency for a direction towards the centre of the Aegean basin. In the Northern part of the region the pressure stress often also has an about horizontal position, giving rise to transcurrent fault motions of the sense known to be active in Northern Anatolia. In the Southern part pressure stresses often steeply dip, resulting in normal and dip-slip thrust faulting in Northeasterly azimuths.

Evidently, the earth crust in this tensional regime is in a state of collapse, which in itself is an indication for basin formation. This type of motion is also in accordance with the geomorphological data of the region. A remarkable note is that the Western and Central part of the volcanic arc in the centre of the collapse area is devoid of any major seismic activity, indicating that adjustments to the existing stresses in the region do occur in a non-elastic way, possibly by a lower viscosity of the material.

CONCLUSIONS

12. Merits and limitations of the present study

The data-set of this report, presented in the form of the Catalogue and figures is the most complete of its kind that ever has been published for any region of the world of the dimensions of the Balkans. The number of solutions, their quality and their completeness as part of a time sequence compare favourably with studies of other regions.

A more or less clear picture has been obtained of the prevailing earthquake generating stresses in the region. The two stress regimes that were found could be linked to

- a. the zone of collision compressions from the Alps in the North to the Aegean arc in the South between the African plate on the one hand and the European plate and Anatolian sub-plate on the other side; and
- b. the influence of the subsiding Aegean Sea basin causing a tensional regime in the whole of the innerpart of the region to far inland in the Anatolian and South European blocks.

Notwithstanding the good conditions in terms of numbers of earthquakes and of recording stations in the region for a study like this, it is not well possible for the present author to go into much more detail in the explanation of the individual earthquake mechanism solutions. Therefore, a more intimate knowledge of the basic facts of other geo-disciplines in the region is imperative, such as local build-up of the earth's crust and upper mantle, the young geological and tectonic structures, recent crustal movements, and possibly gravity and magnetic anomaly fields. Such an interpretation on a smaller scale should be made by local workers in the field as a natural and necessary extension of the present report.

13. Recommendations

- a. The interpretation of the individual solutions of the Catalogue lists should be undertaken by local workers in the field. Comparisons should be made with local structure, young tectonics, seismicity, recent crustal movements and data from other geo-disciplines.

Correlations between the two should be studied for a discrimination between the regional stress field as established in the present report and local anomalies on this field, and with the goal to clarify observed characteristics of seismicity and geological structure.

b. The quality C and D solutions of the Catalogue should be reconsidered in view of the present results based on quality A and B solutions, and for the sake of finding supporting evidence for the found rules and correlations in the solutions from a given sub-region.

c. For a new separate and special study a list of earthquakes, presently without a mechanism solution, should be set up. Reasons for the selection could be the particular magnitude, depth, location or time of occurrence of the shock. In the first place one thinks of a completion of the mechanism work for areas for which only small numbers of solutions are available, or only low-quality solutions of small magnitude shocks. The regions 359 and 363 of Bulgaria and Thessaloniki are prime candidates for this regional choice; also Northern Yugoslavia that is equally under-represented in the Catalogue. In the second place one can think of a systematic study of older earthquakes of the pre-1960 and pre-1950 years. The annual numbers of solutions for these periods are very much lower than for more recent years. Partly, this is a natural effect of the density of reliable seismic stations in the region in time. As it is clear that the magnitude level for which a solution still can be made with confidence will shift to higher values for the earlier years. There is, however, still a reservoir of data piled up in the archives of the seismic stations with a relatively long history. This is especially true when the study of these older events is linked to comparable readings of more recent earthquakes of the region for which a good quality solution is available.

d. Maintenance of the information flow of this kind by a determination on routine basis of the fault plane solutions of current earthquakes in the region is of great importance. A Service Bureau in the region gathering continuously all information on compression/dilatation data of earthquakes of the region might be very helpful in this respect. A preliminary solution could be made within a

year of the time of occurrence of the earthquake, a final determination should be made later when more data of distant stations and of central bulletins are available. The Bureau could issue yearly additions to the present Catalogue of data. It could also act as a centre of co-operation between research groups of the different participating nations.

e. Extension of the fault plane work by the use of S wave readings and radiation of surface waves is the next step. This work most fruitfully might be done by certain research groups in the participating countries. Potentially it is of the utmost importance for a better definition of the earthquake mechanism and studies in this direction should be strongly encouraged. On the other hand, the results of such studies are not per definition less controversial because they are based not only upon data of a qualitative kind such as in the classical work, either + or -, but also on quantitative measurements of amplitudes. It is clear that additional uncertainties are introduced and that studies of this kind are not "a priori" more reliable. A separate development of the two kinds of approaches seems to be the most fruitful in this stage of the investigations, and for the time being this work of a more specialist kind should be executed there where the expectations for results are optimal.

f. A natural development will be that additional studies are carried out on the problems relating the present kind of earthquake mechanism work with that of earthquake sequences in particular regions. Ultimately, the efforts directed in this field could possibly support the investigation of the problem of earthquake prediction. Investigations of this co-ordinated kind are best executed on the spot by local experts.

g. A Resolution of the Balkan Project group should be sent to the authorities in Libya with the suggestion to set up some seismic stations in Cyrenaica and Libya itself. Often, in the course of the present study, the lack of data from this region was of decisive importance in the qualification of the solution as unreliable. For future researches the data from some stations in this country could very much enhance the reliability of location, depth and mechanism solution of the earthquakes of the Balkan region.

h. A good exchange of data between all nations in the region on a routine basis is considered a "conditio sine qua non" for the development of future research in the field.

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FIGURES

REGIONNUMBERS FLINN - ENGDAHL

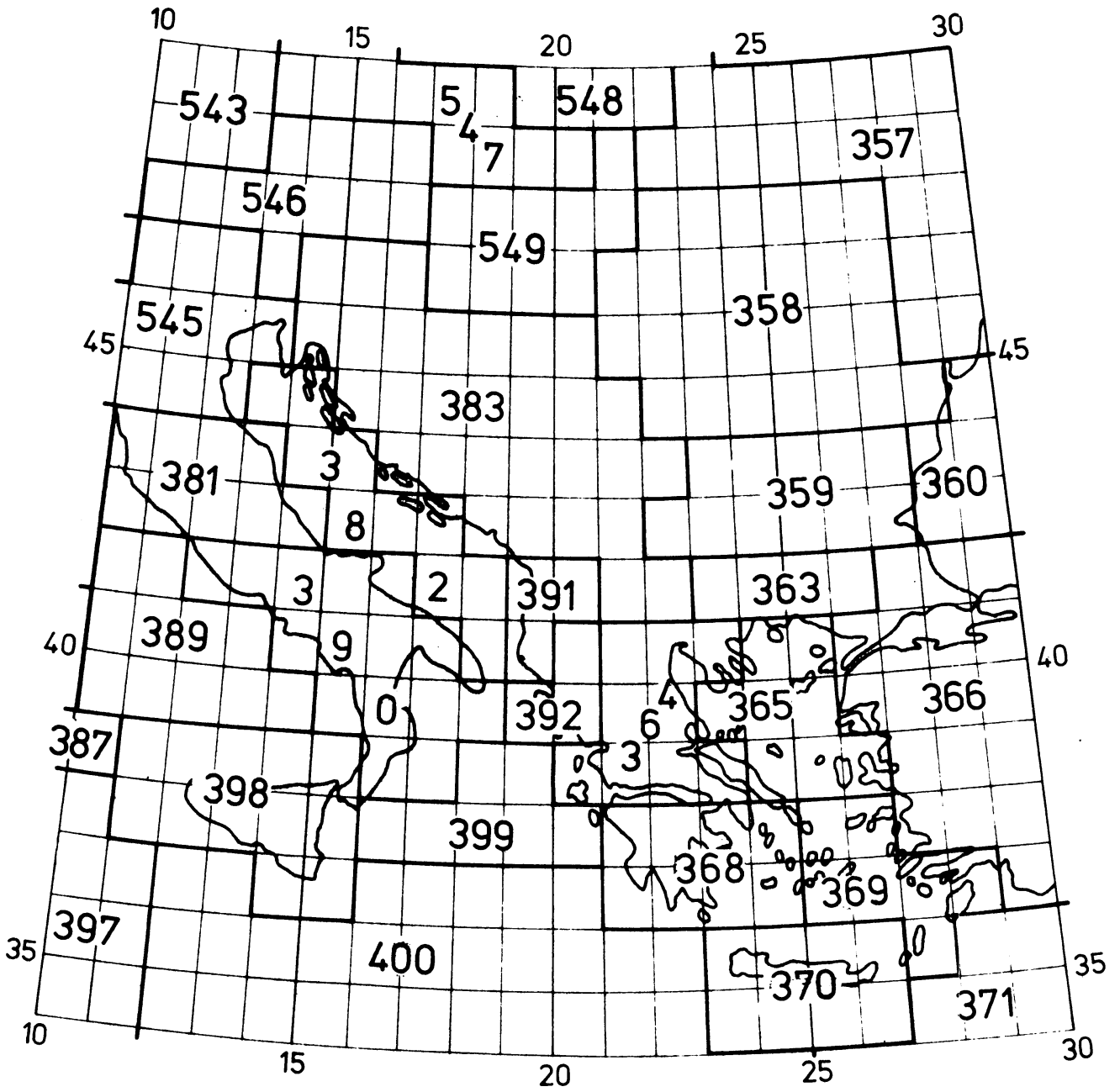


Figure 1. The outlines and numbers of the regional division of the Balkan according to Flinn-Engdahl.

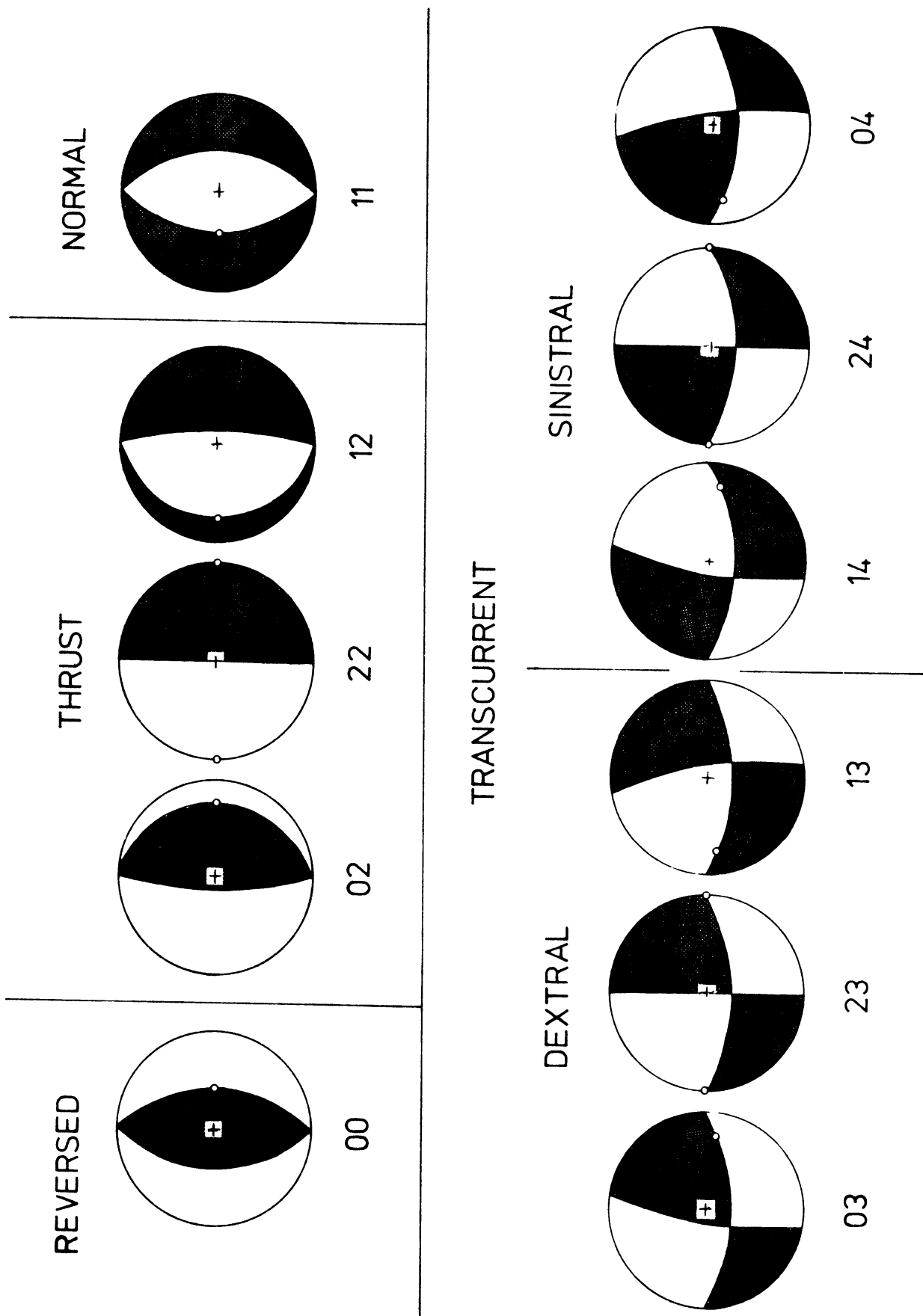


Figure 2. The different types of earthquake mechanism solutions.

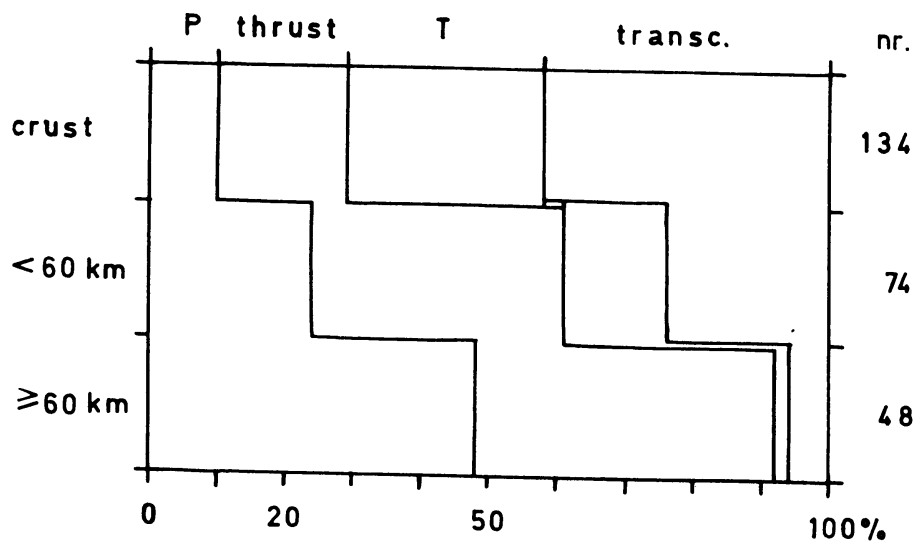


Figure 3. The distribution of earthquake mechanism types in depth.

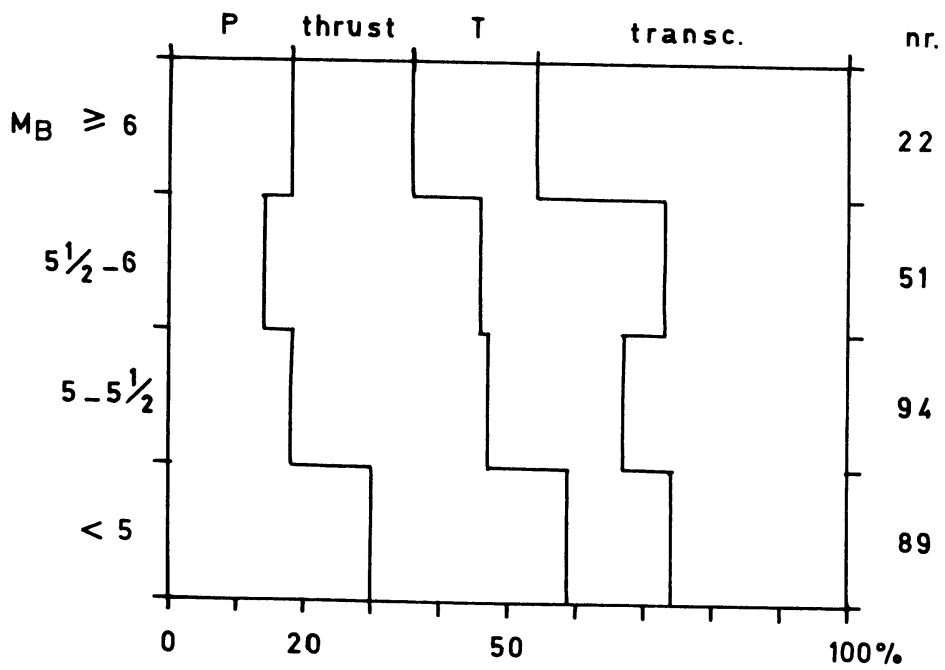


Figure 4. The distribution of earthquake mechanism types in magnitude classes.

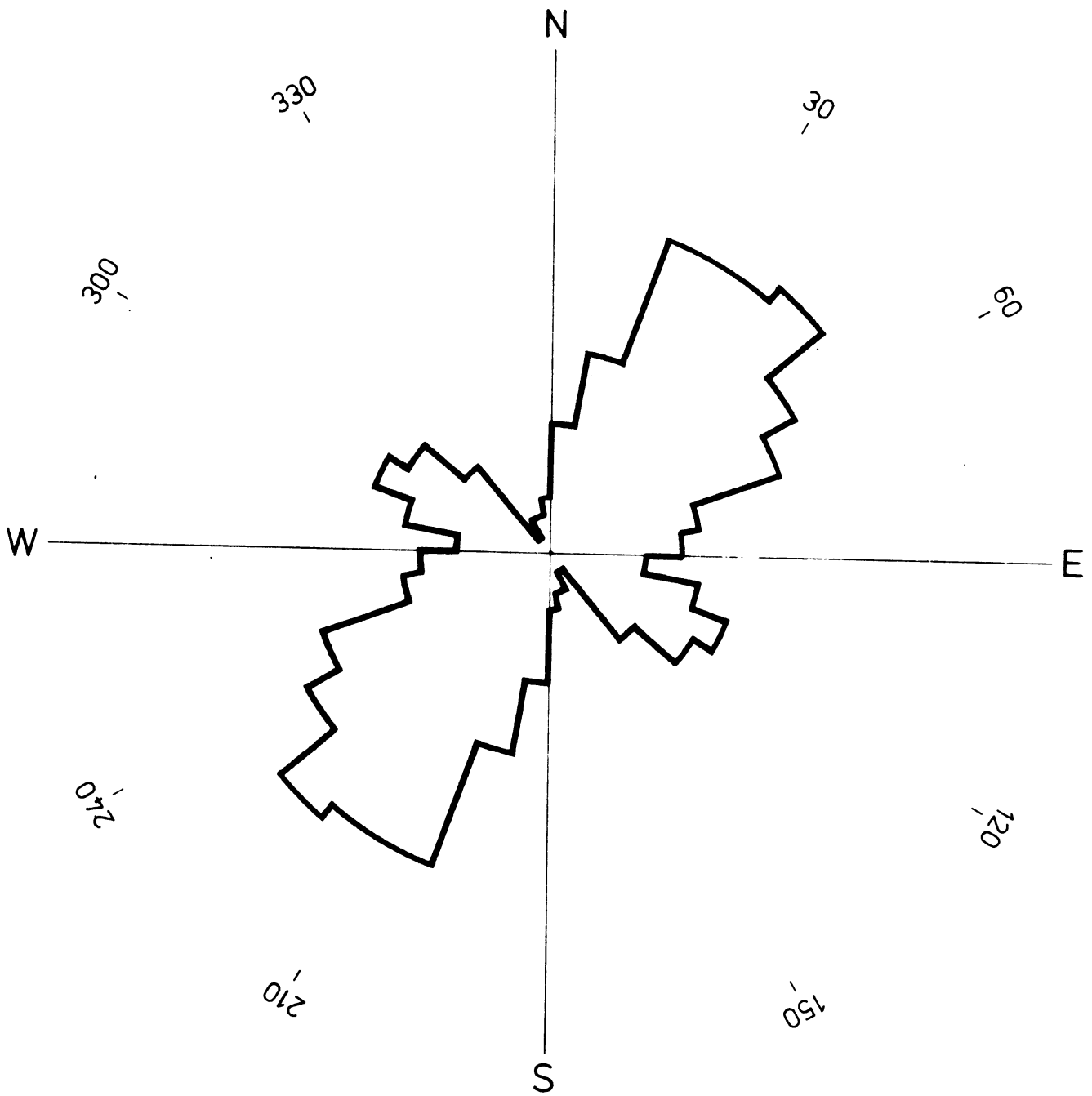


Figure 5. The azimuth distribution of the P-axes of 54 Balkan earthquakes of the reversed fault motion type (P-type).

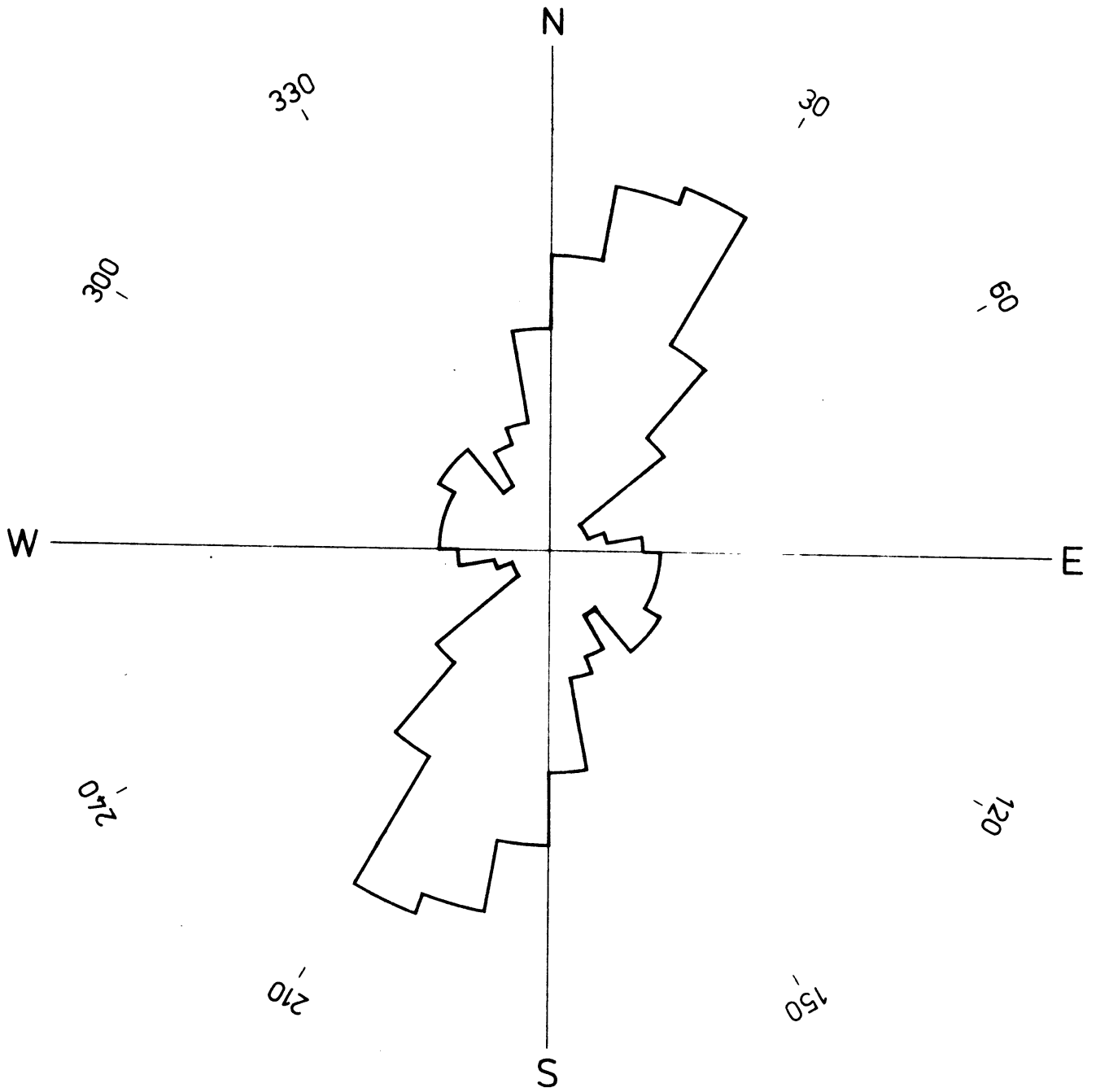


Figure 6. The azimuth distribution of the T-axes of 51 Balkan earthquakes of the normal fault motion type (T-type).

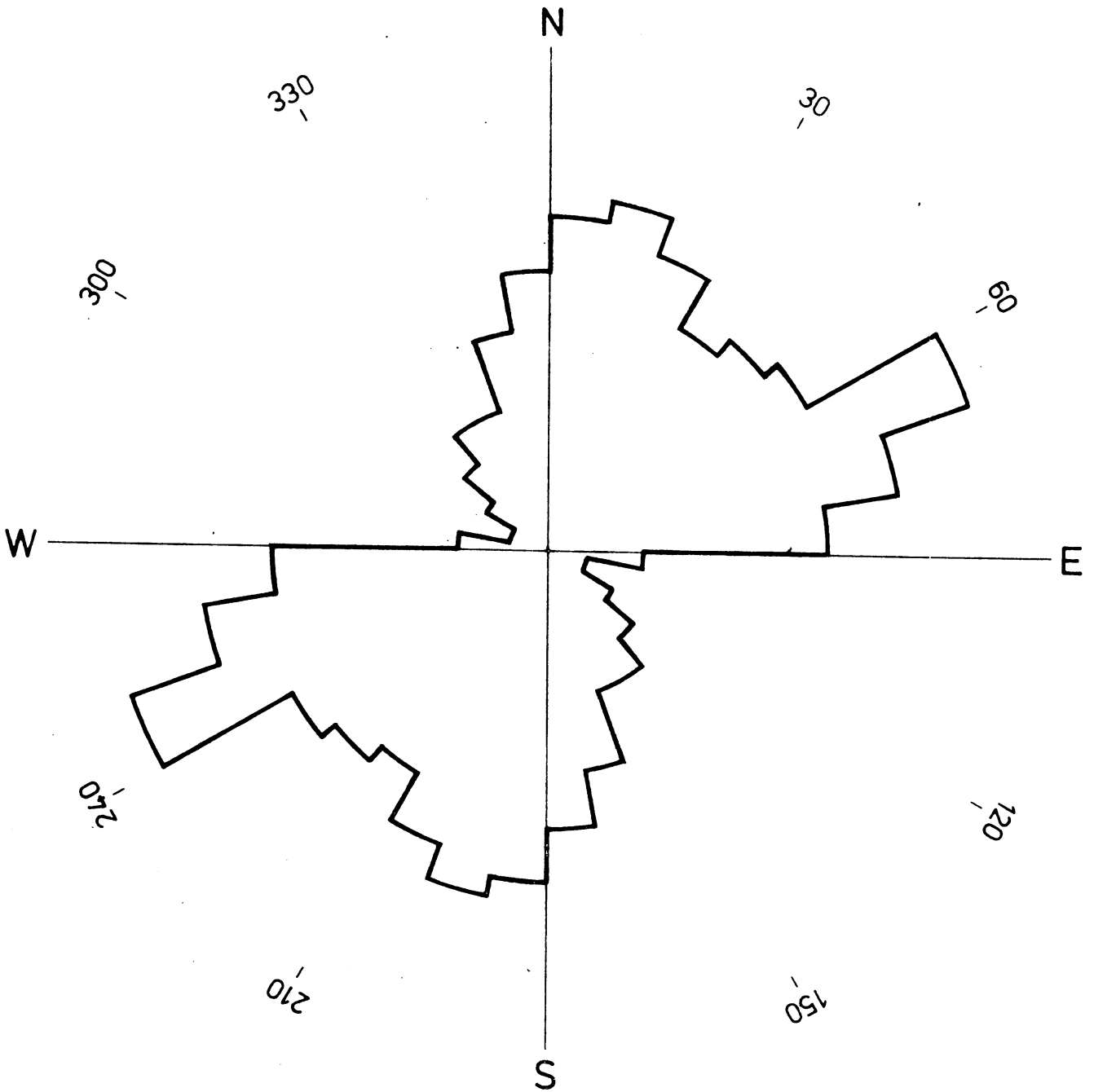


Figure 7. The azimuth distribution of the A-axes of 73 Balkan earthquakes of the thrust (or vertical block) motion type.

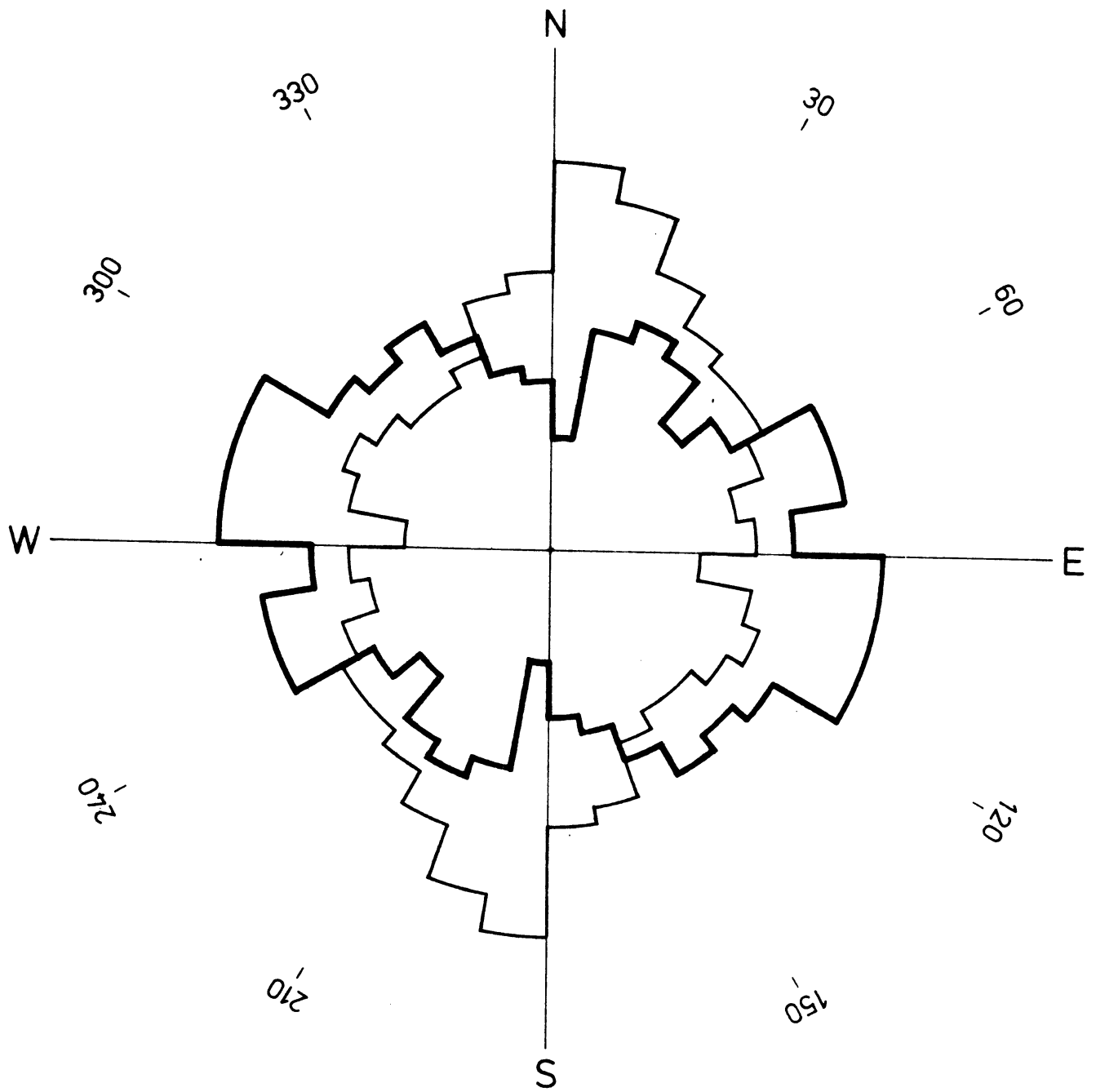


Figure 8. The azimuth distribution of the P-axes (thick line) and T-axes (thin line) of 78 Balkan earthquakes of the transcurrent fault motion type.

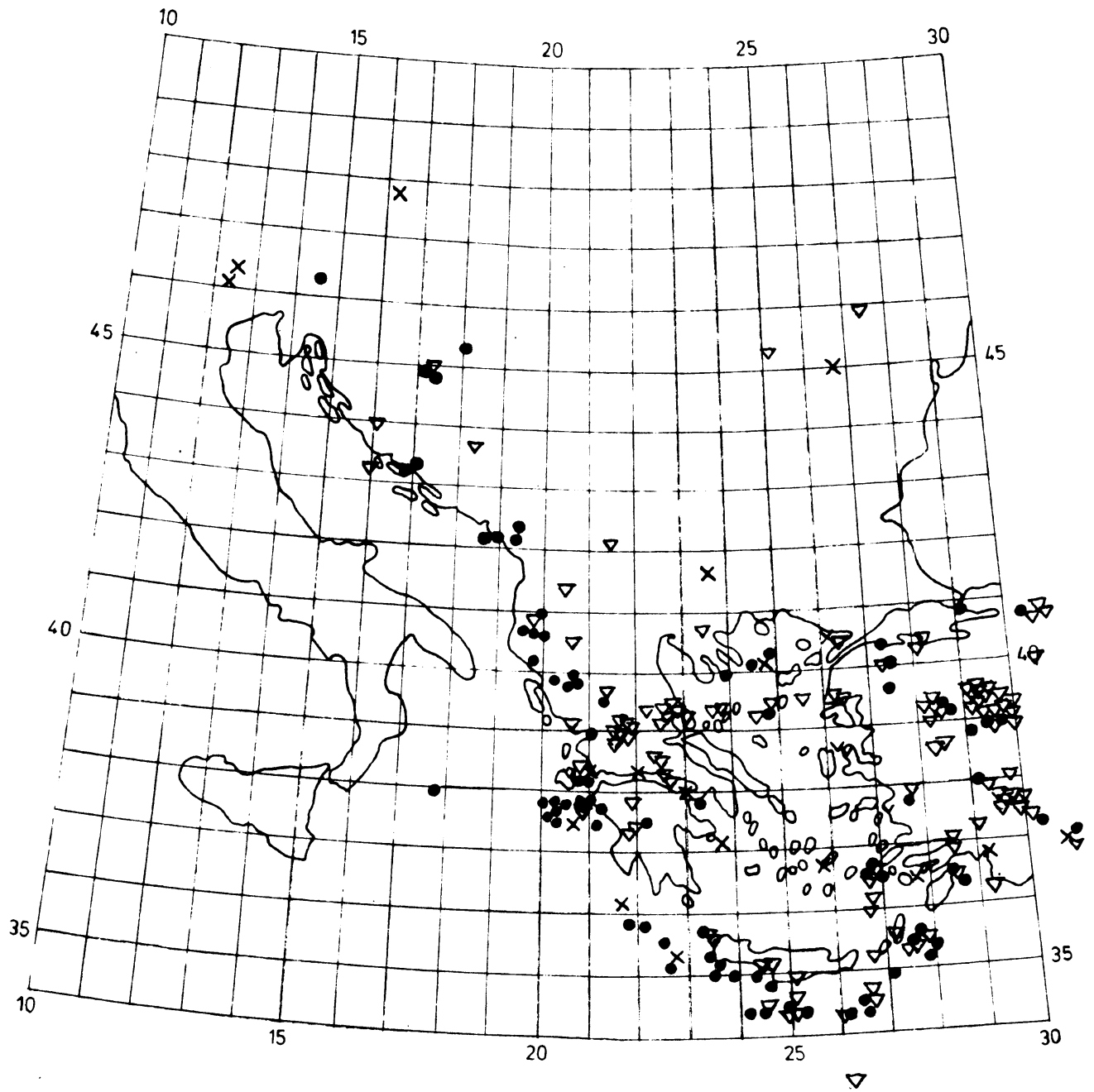


Figure 9. The location of the earthquakes with quality A or B solutions of the P-type (dots), T-type (triangles) and =-type (crosses). In P-type earthquakes the plunge of the P-axis is smaller than that of the T-axis, in T-type earthquakes the other way around, and in =-type earthquakes the angles of plunge are equal.

Region 358
h > 60 km

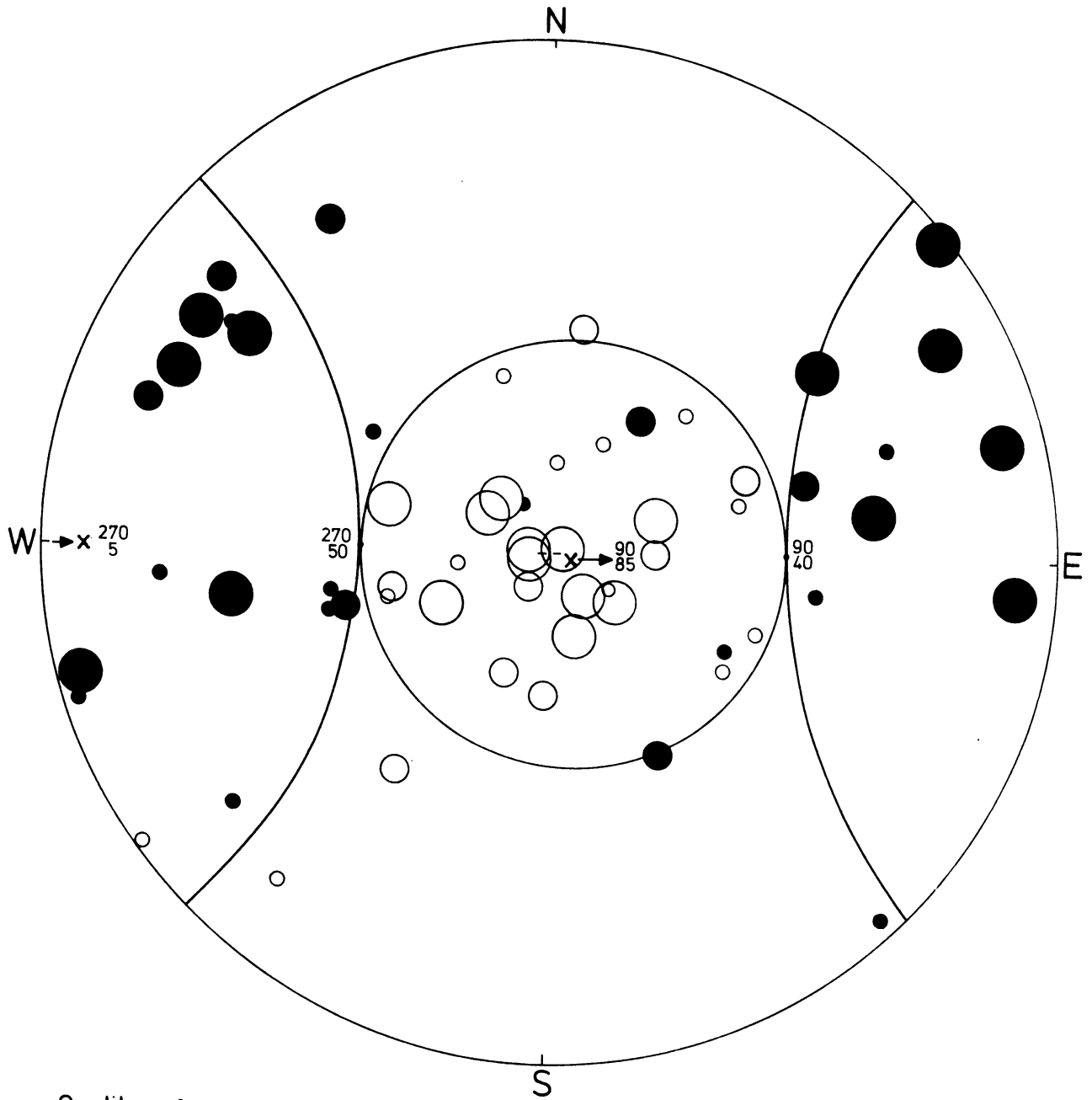
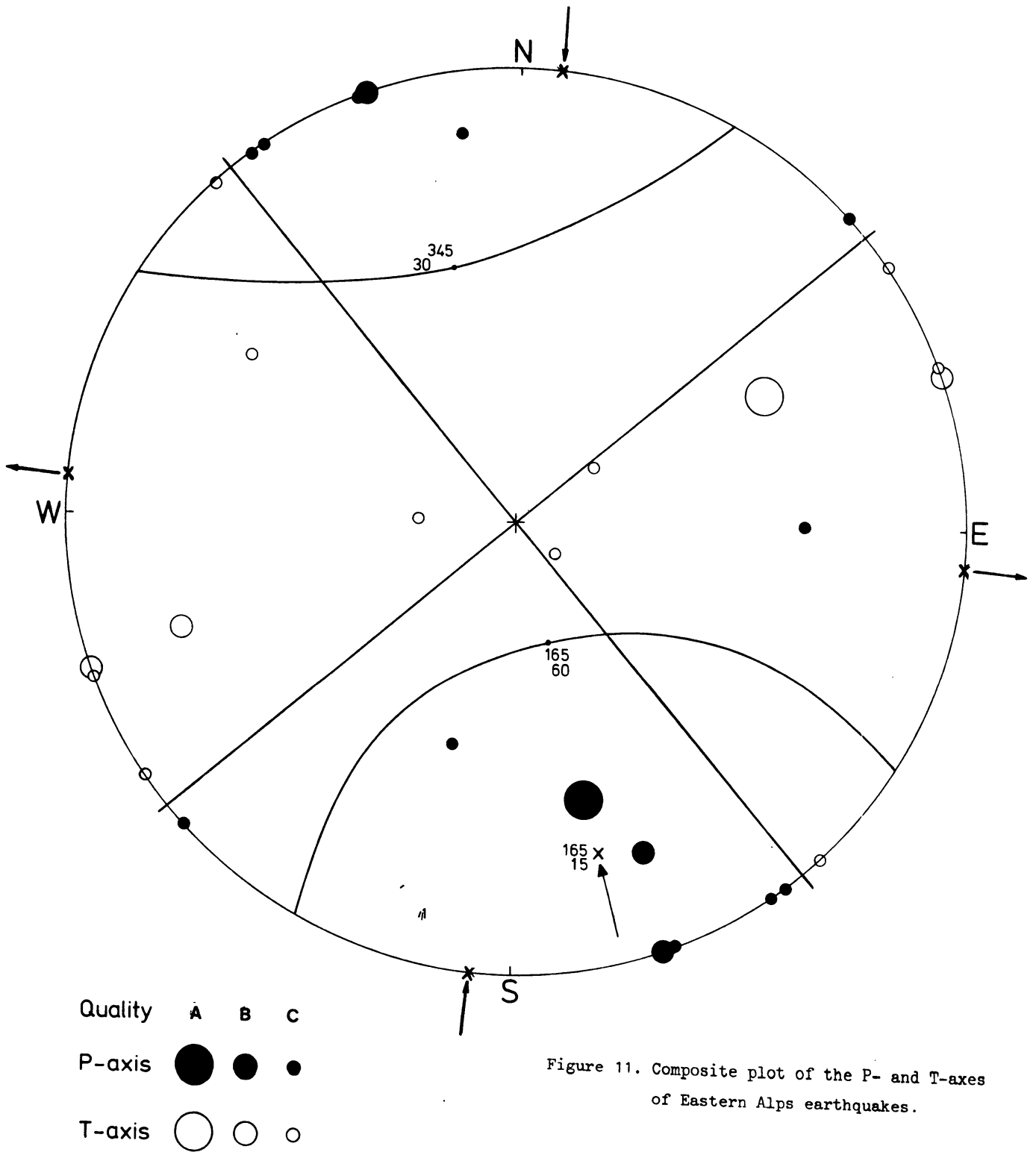
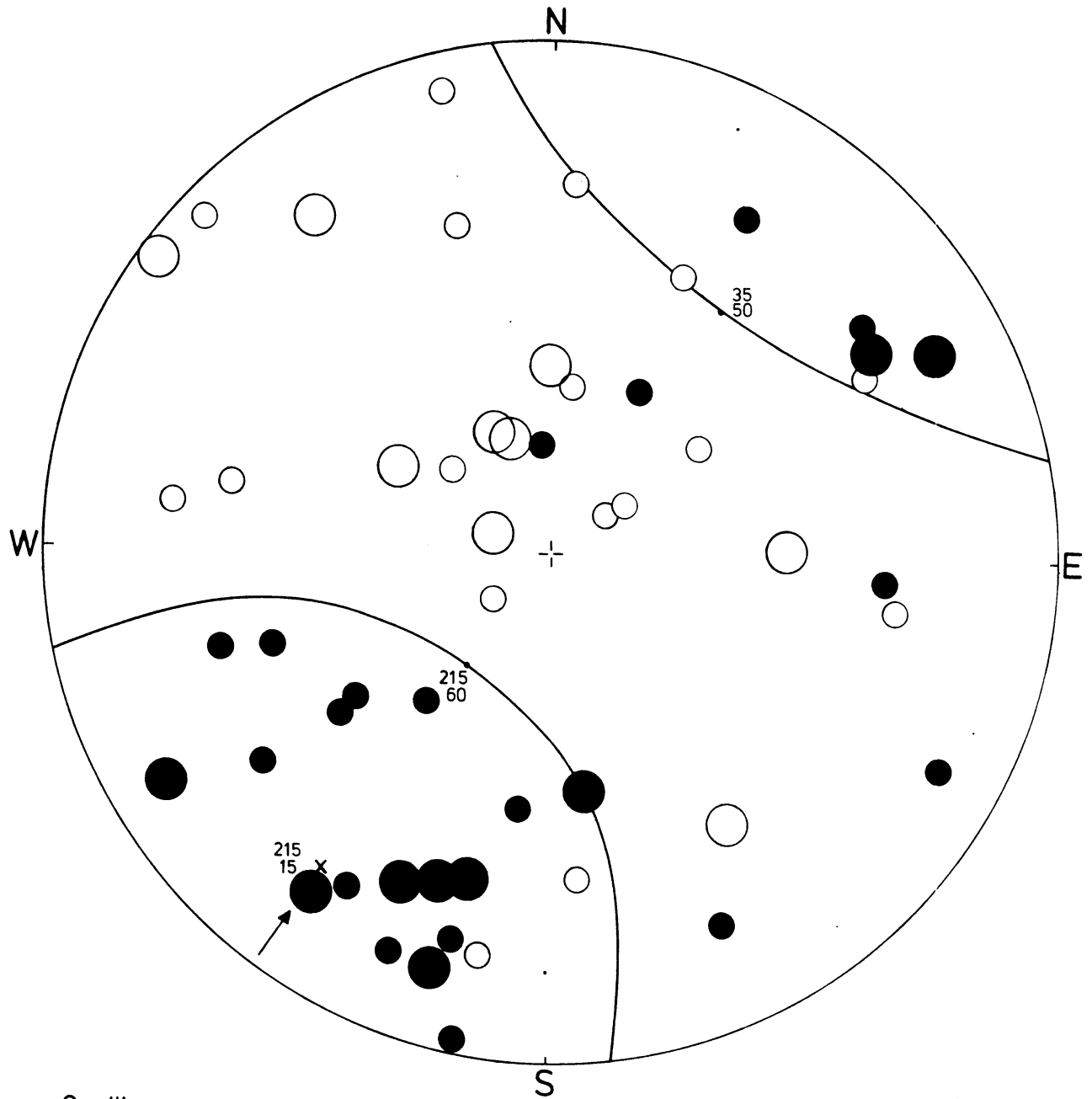


Figure 10. Composite plot of the P-and T-axes
of deep shocks of the Carpathian arc.

Region 545,546,549
 h < 60 km



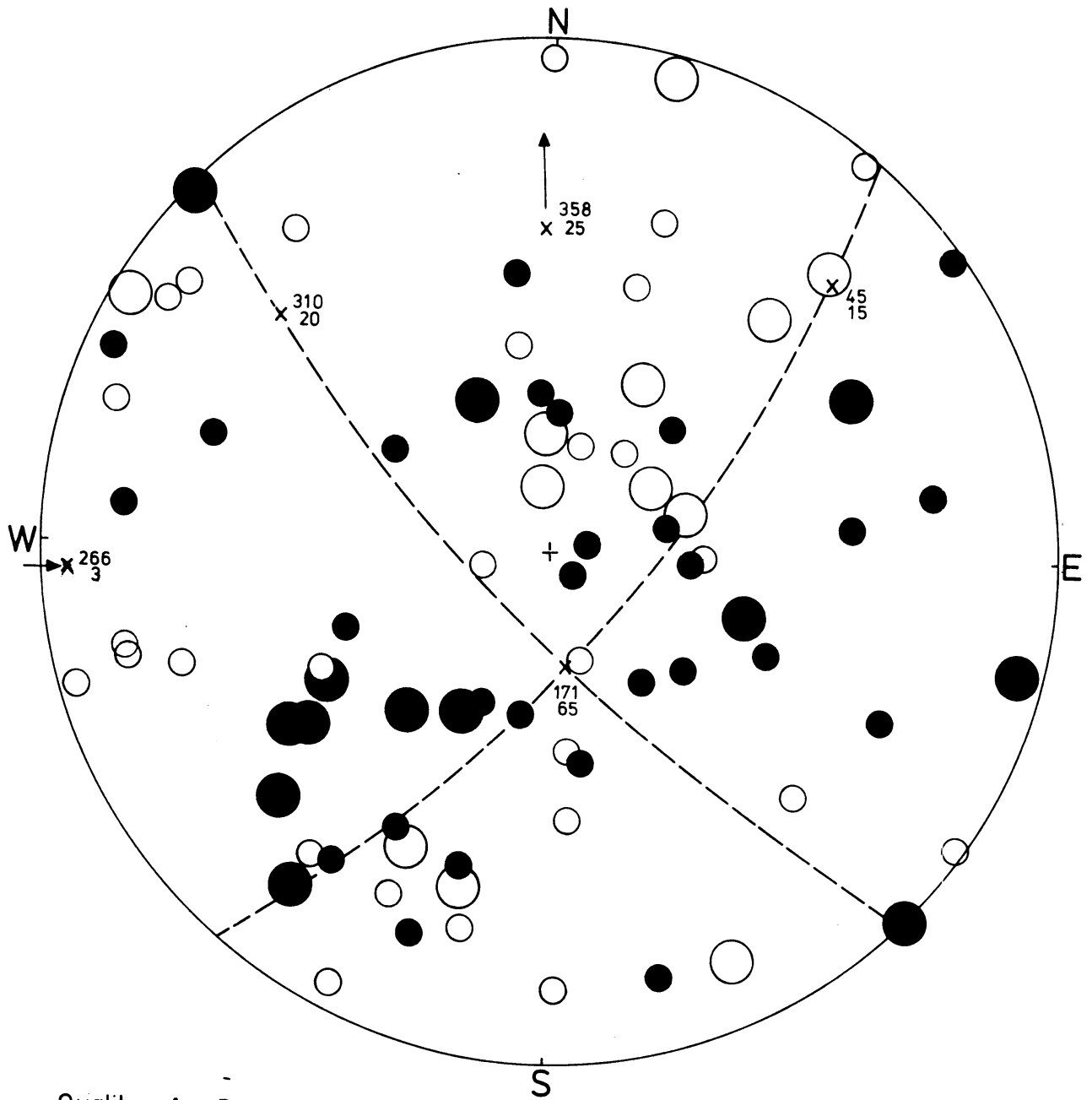
Region 382/383/391/392
h < 60km



Quality	A	B	C
P-axis	●	●	●
T-axis	○	○	○

Figure 12. Composite plot of the P- and T-axes of Yugoslavian and Albanian shocks.

Region 364/399
all depths



Quality	A	B	C
P-axis	●	●	●
T-axis	○	○	○

Figure 13. Composite plot of the P- and T-axes of the earthquakes of Western and Central Greece.

Region 368, 400
all depths

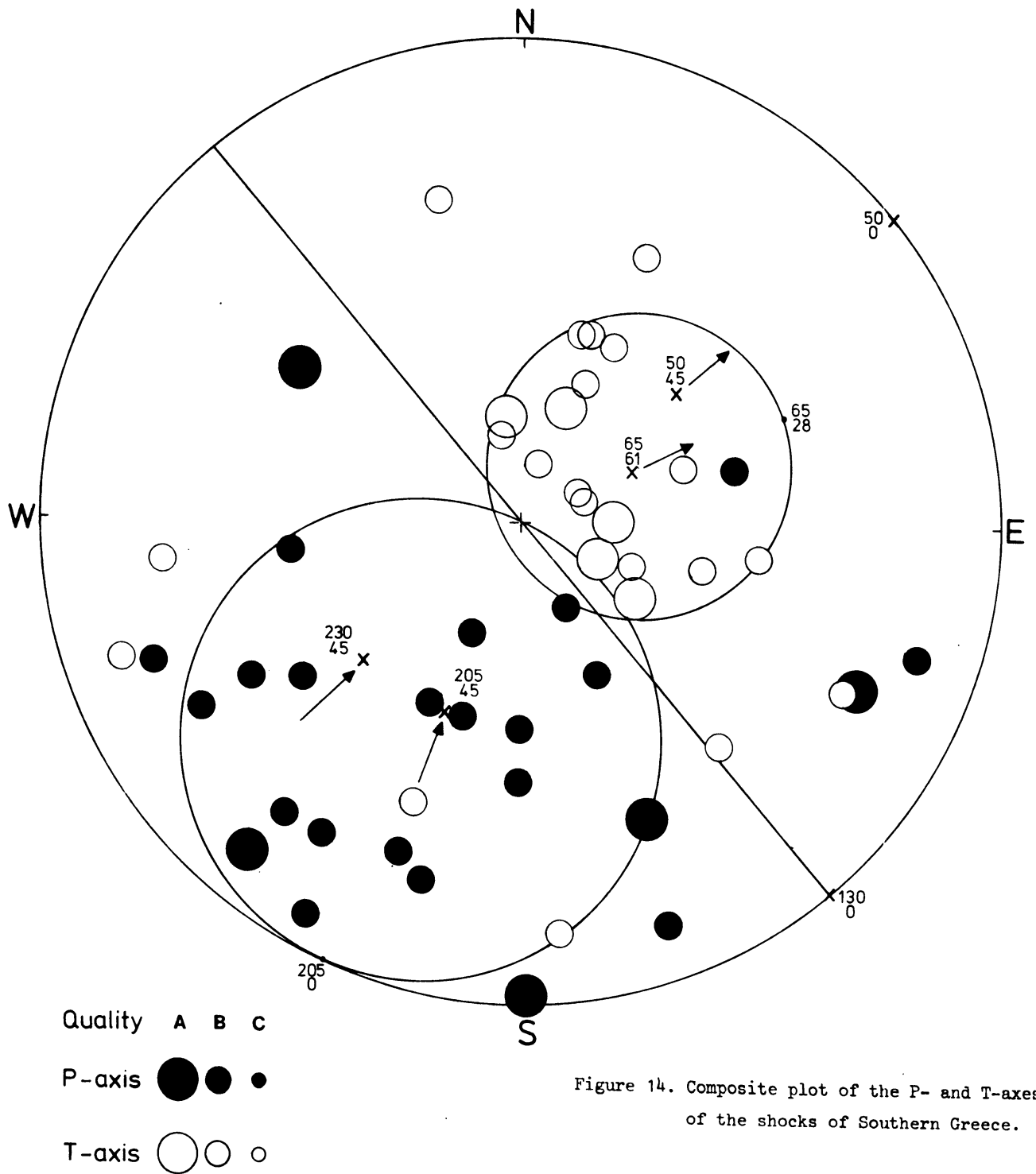
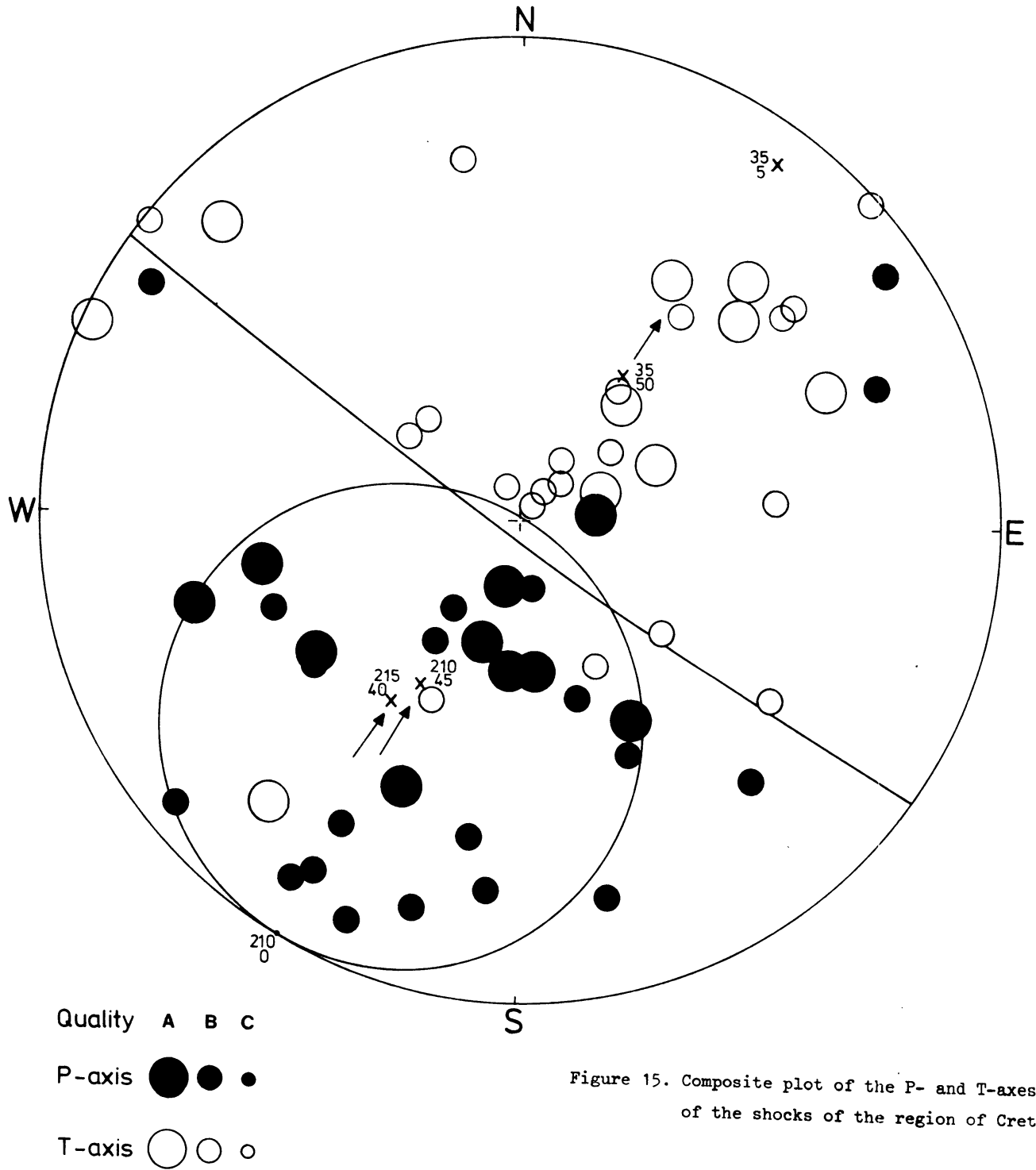
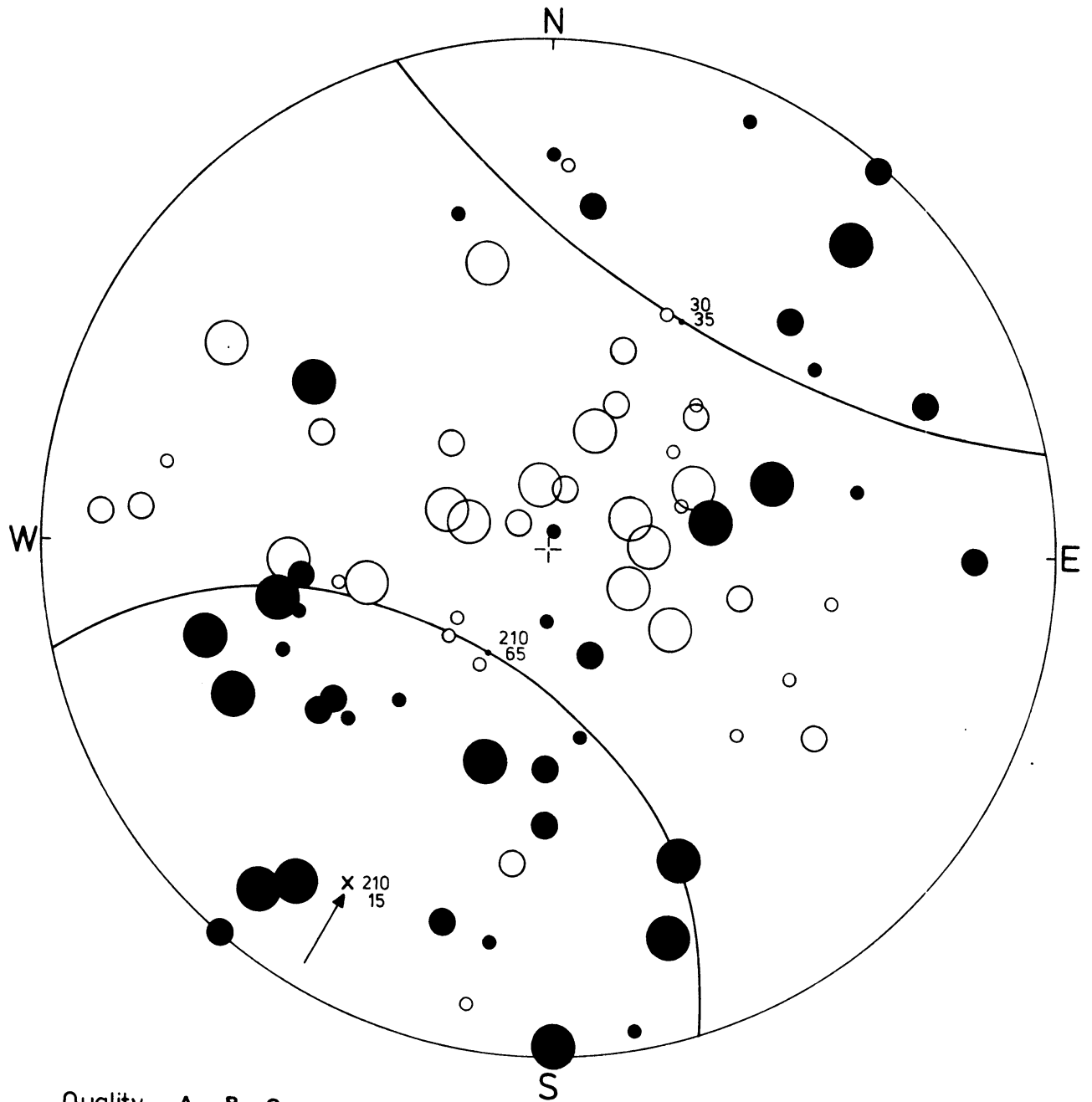


Figure 14. Composite plot of the P- and T-axes of the shocks of Southern Greece.

Region 370
all depths



Region 364/368/369/370
 h > 60 km



Quality	A	B	C
P-axis	●	●	●
T-axis	○	○	○

Figure 16. Composite plot of the P- and T-axes of the deep shocks of the Aegean arc

Region 369
all depths

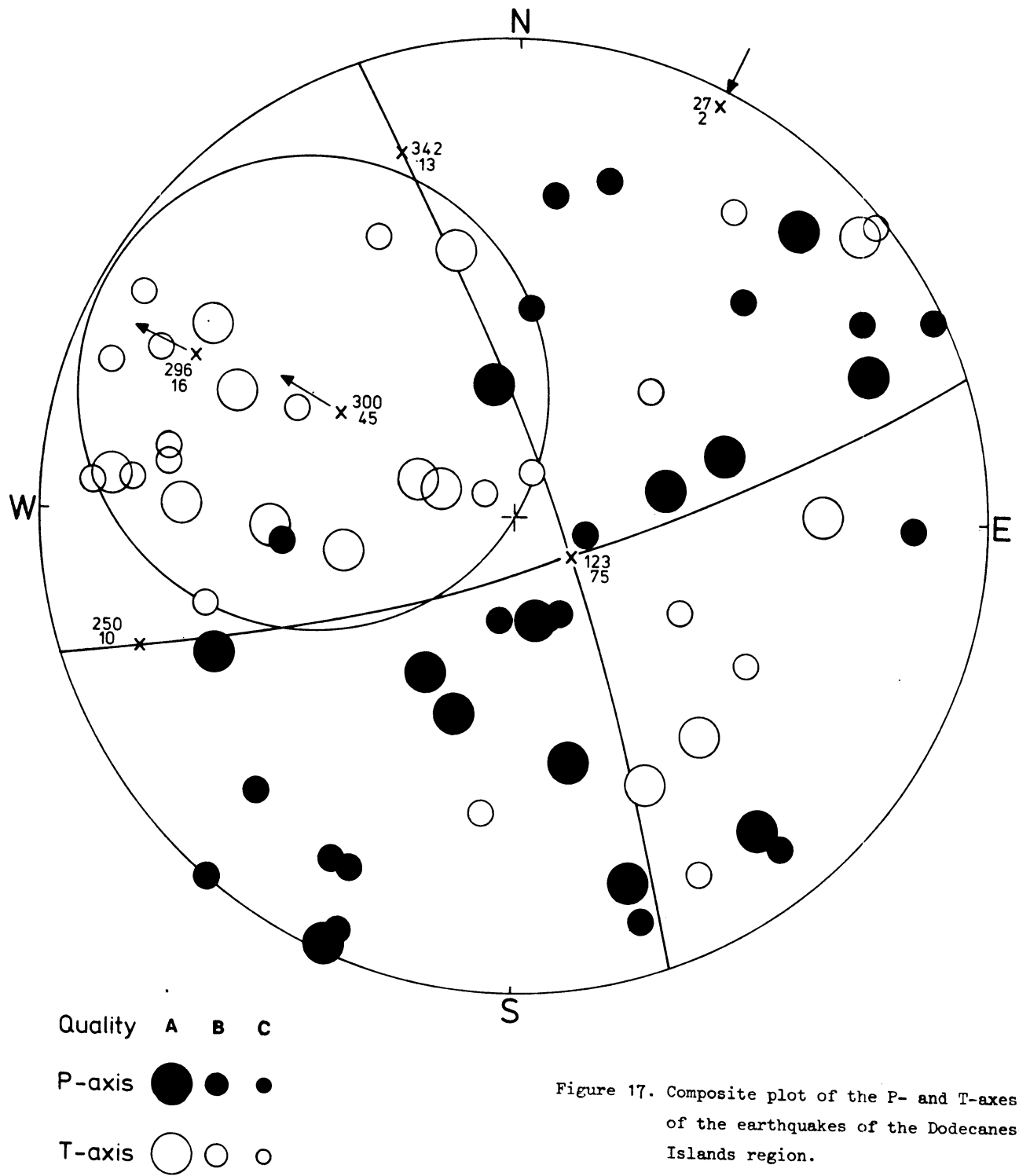
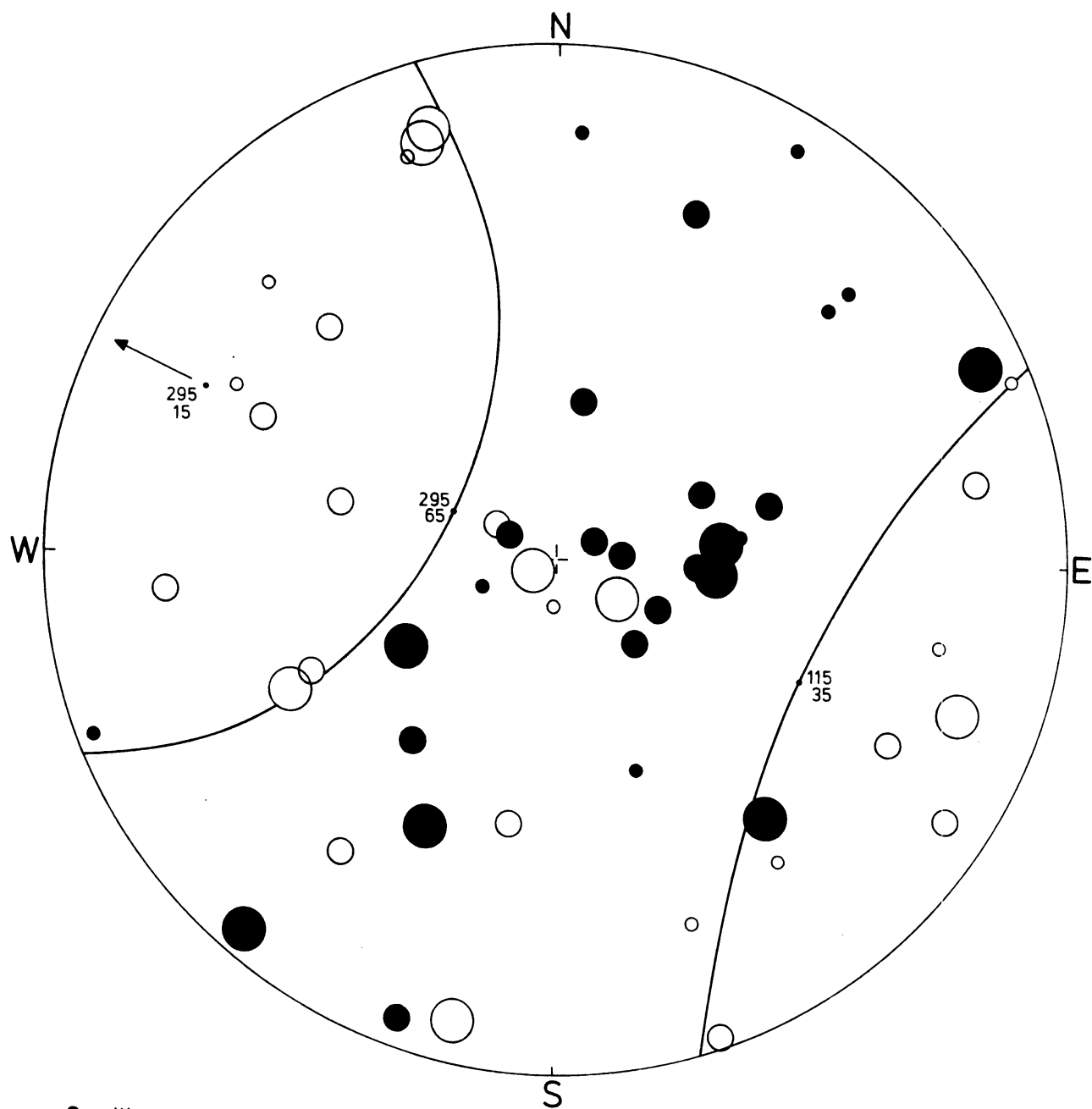


Figure 17. Composite plot of the P- and T-axes of the earthquakes of the Dodecanese Islands region.

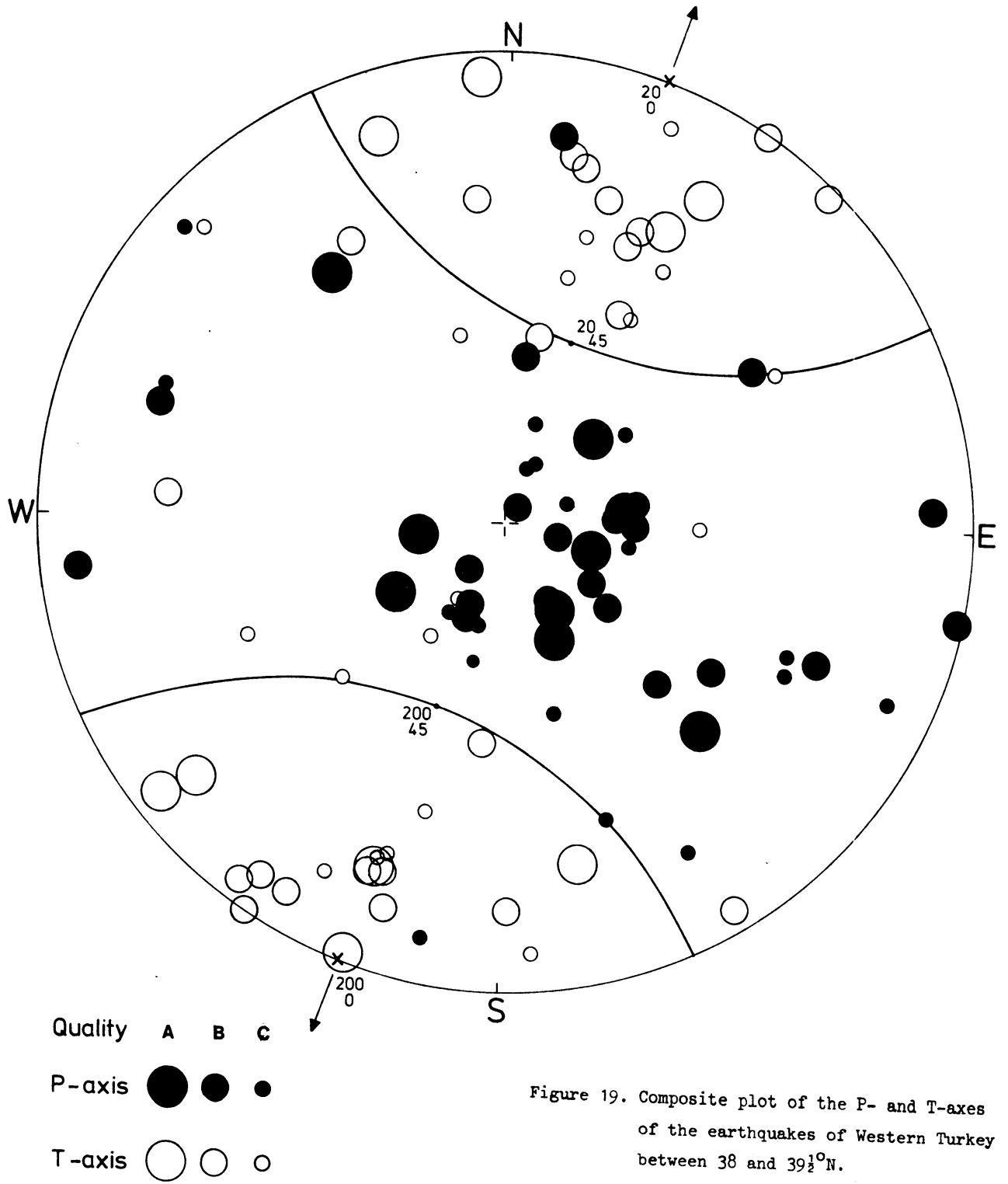
Region 366 C
 h < 60 km



Quality	A	B	C
P-axis	●	●	●
T-axis	○	○	○

Figure 18. Composite plot of the P- and T-axes of the shocks of Western Turkey, South of 38°N.

Region 366 B
 $h < 60\text{ km}$



Region 366 A
 h < 60 km

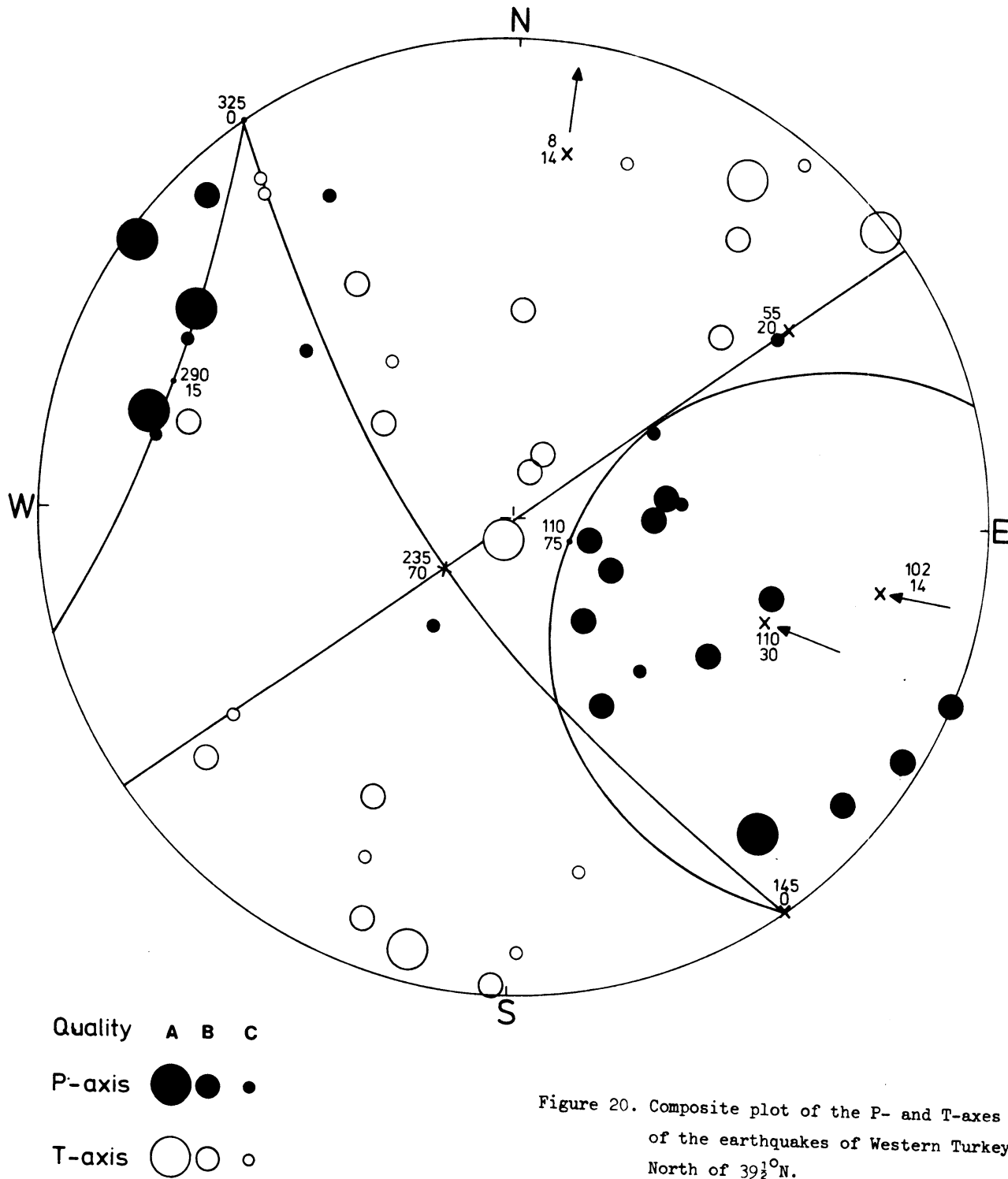


Figure 20. Composite plot of the P- and T-axes of the earthquakes of Western Turkey North of $39\frac{1}{2}^{\circ}\text{N}$.

Region 363/365
 h < 60 km

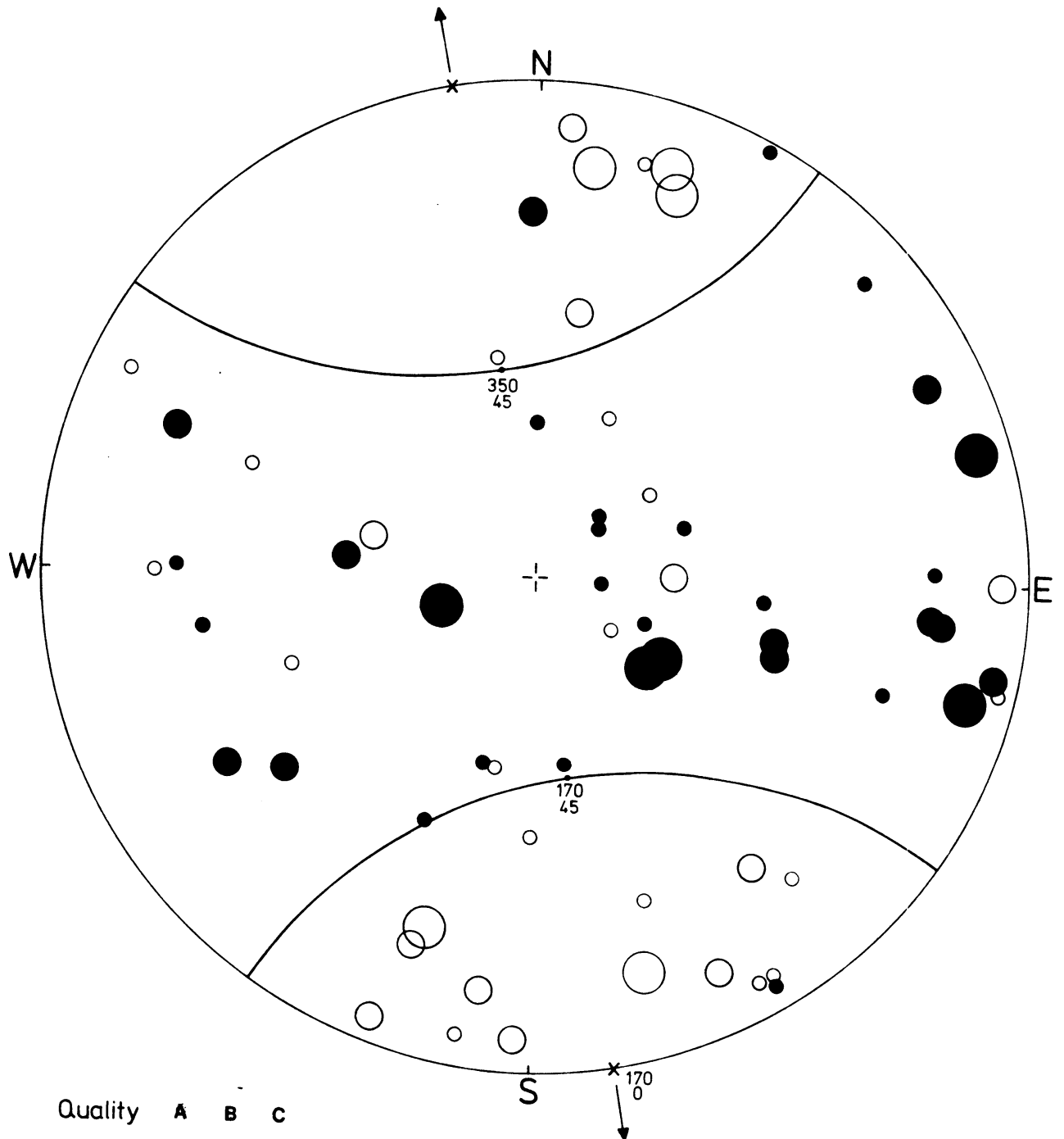


Figure 21. Composite plot of the P- and T-axes of the earthquakes of the North Aegean Sea and South Bulgaria.

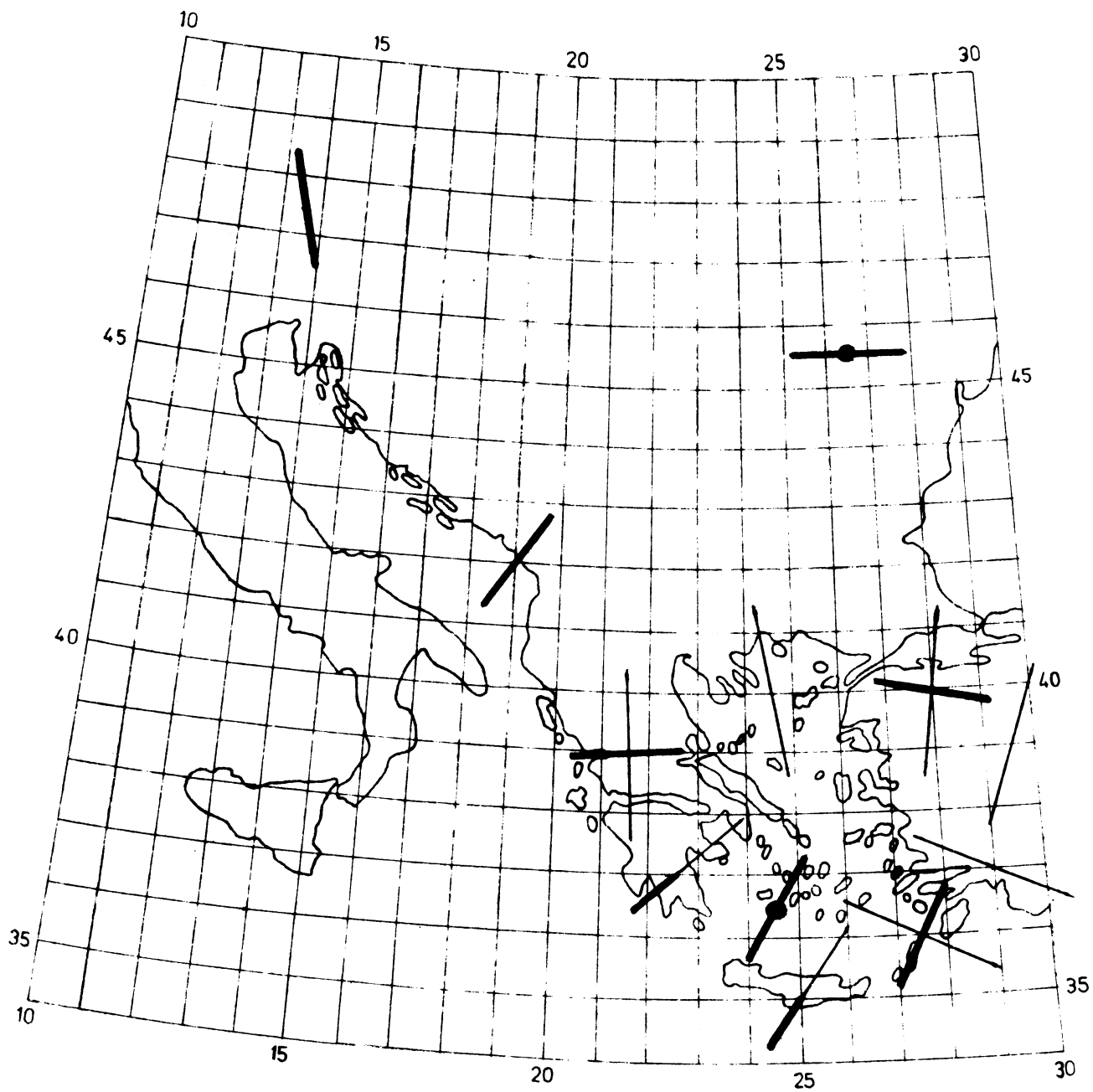
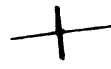
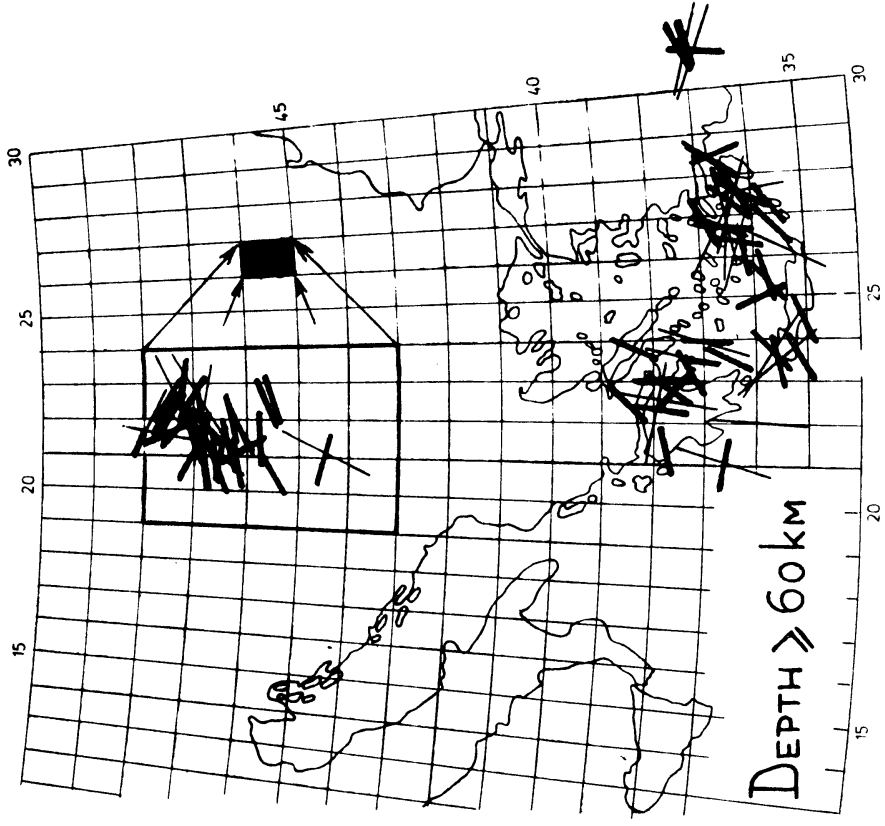
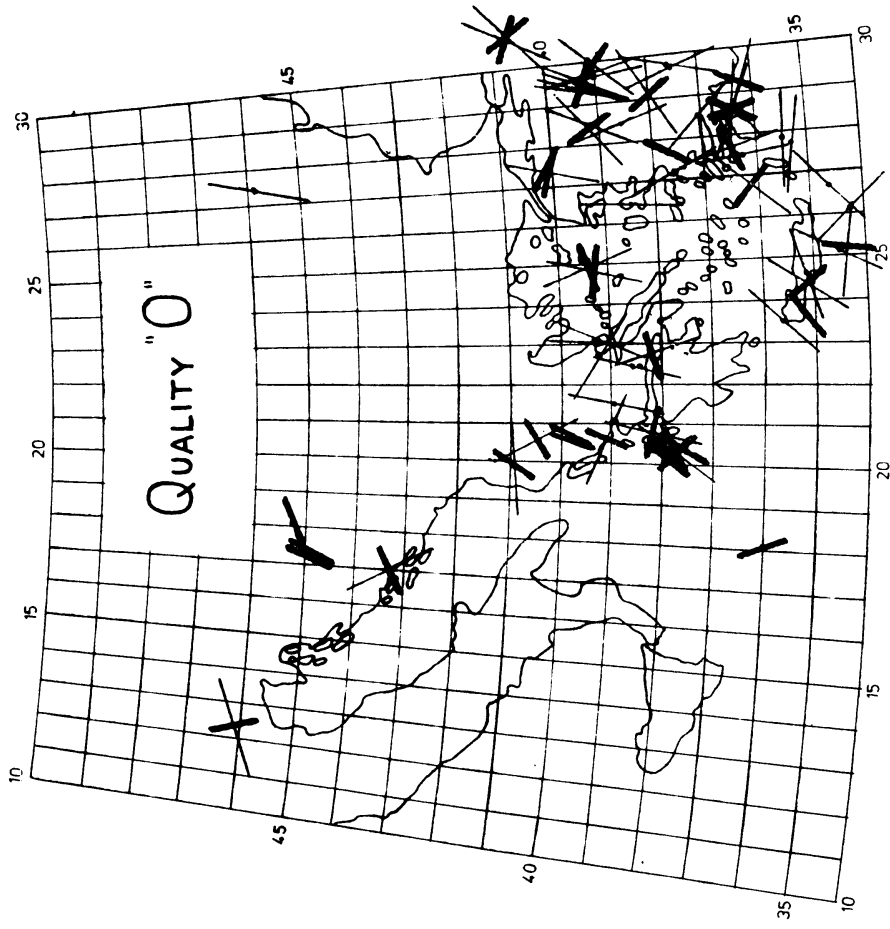


Figure 22. Regional directions of the main earthquake generating stresses. Compressional stress (solid bar), tensional stress (thin bar), deep earthquake zones (solid bar with central dot).

EARTHQUAKE MECHANISM SOLUTIONS

P-AXIS ↓ T-AXIS ↘



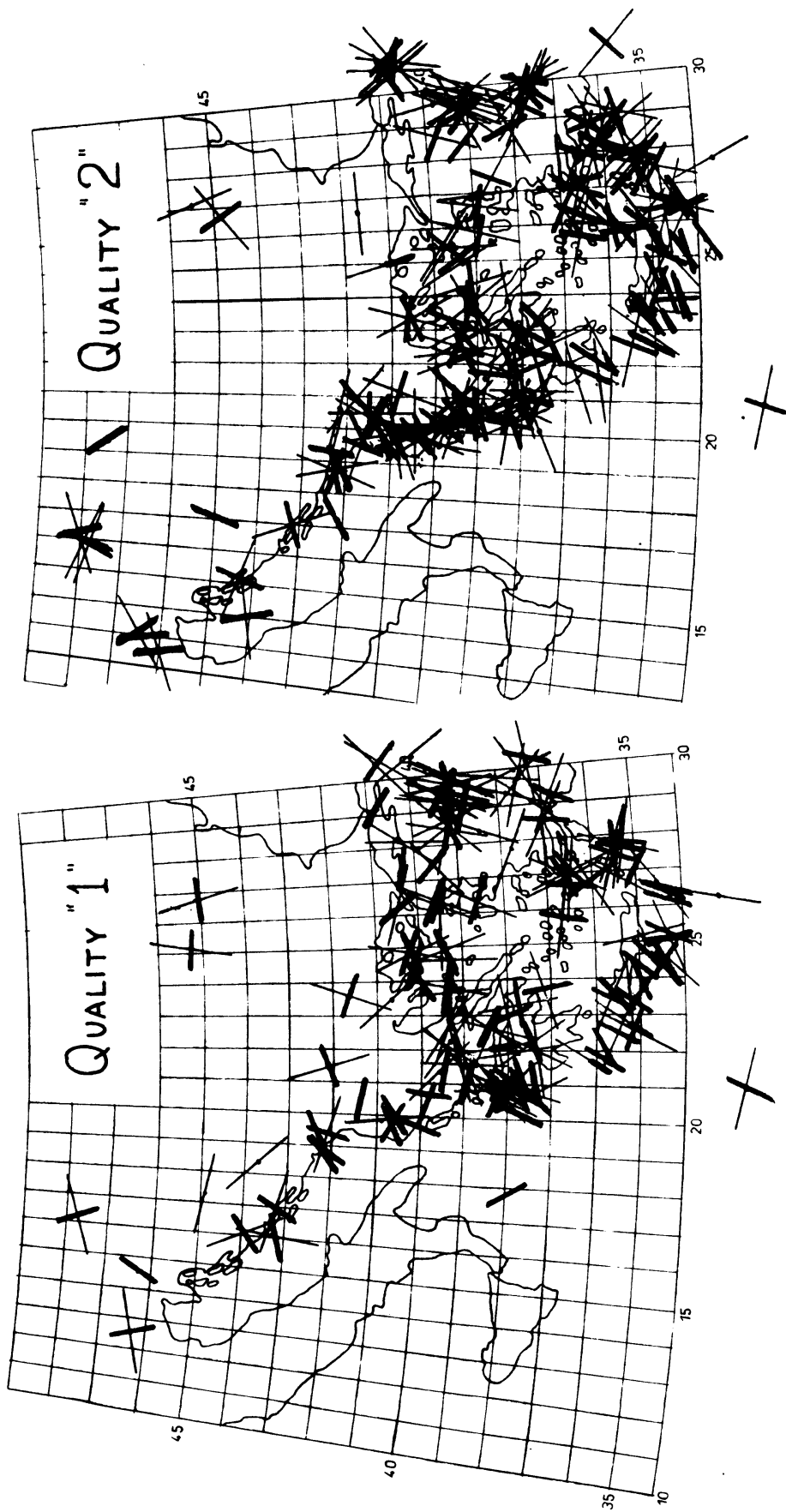


Figure 23. The direction of P- and T-axes in individual earthquakes with solutions of quality A (or 0), quality B (or 1) and quality- C+D (or 2) for foci down to 60 km, and for the deep earthquakes of the region.

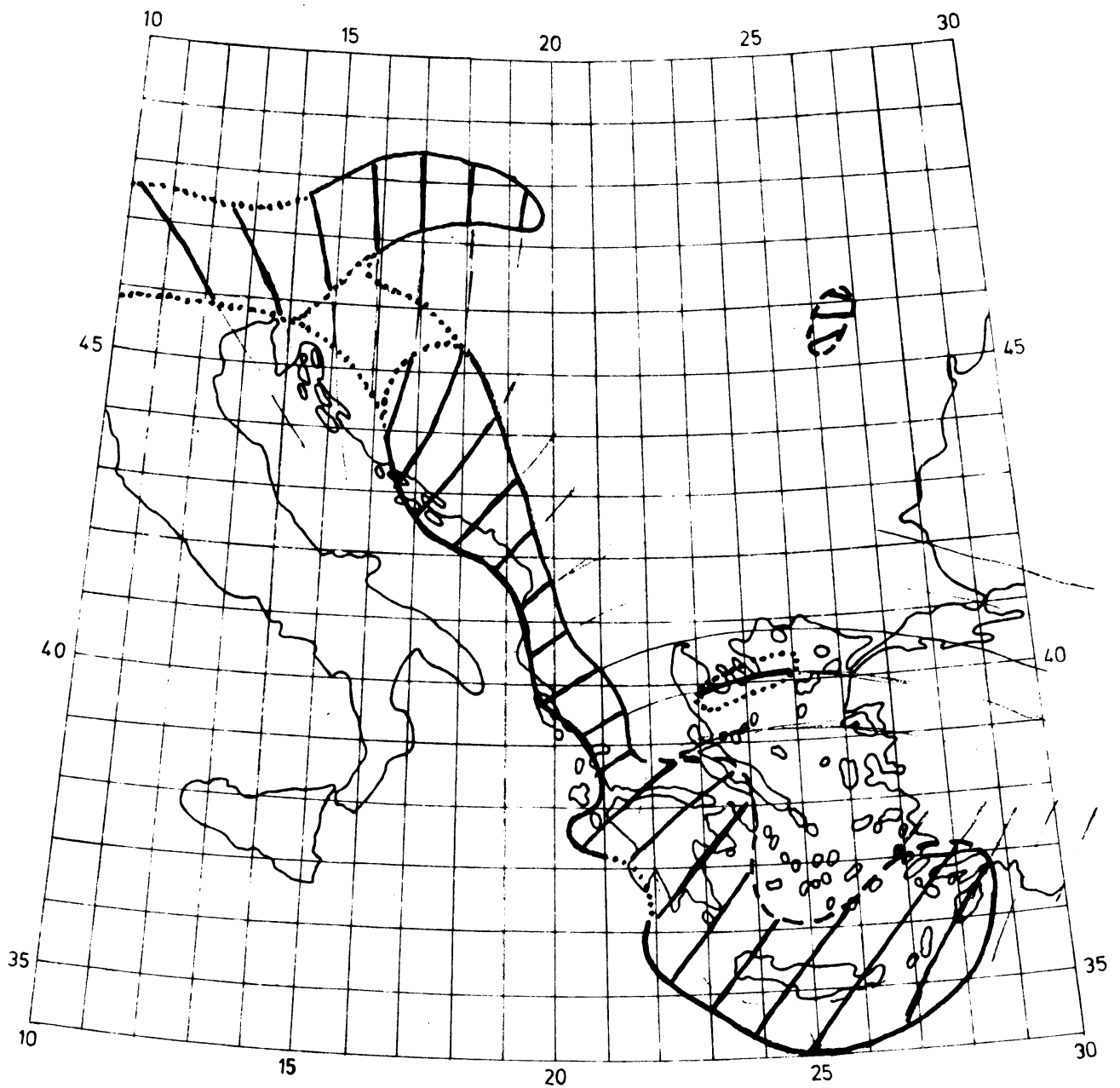


Figure 24. The general direction of compressive stress throughout the Balkan region. In the outlined area the P-axis normally plunges at a smaller angle than the T-axis. Dashed line : deep-focus part.

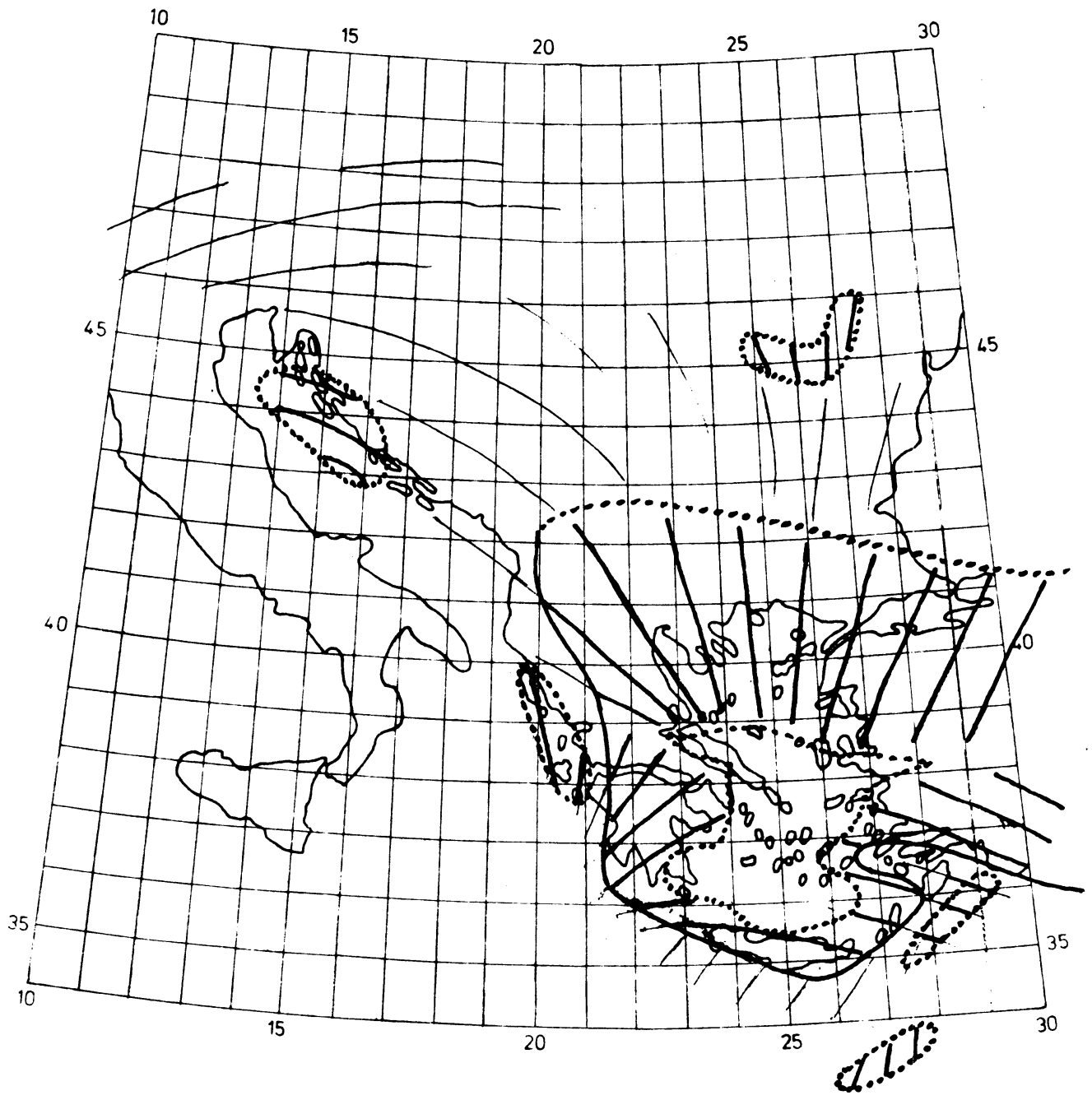


Figure 25. The general direction of tensional stress throughout the Balkan region. In the outlined area the T-axis normally plunges at a smaller angle than the P-axis.

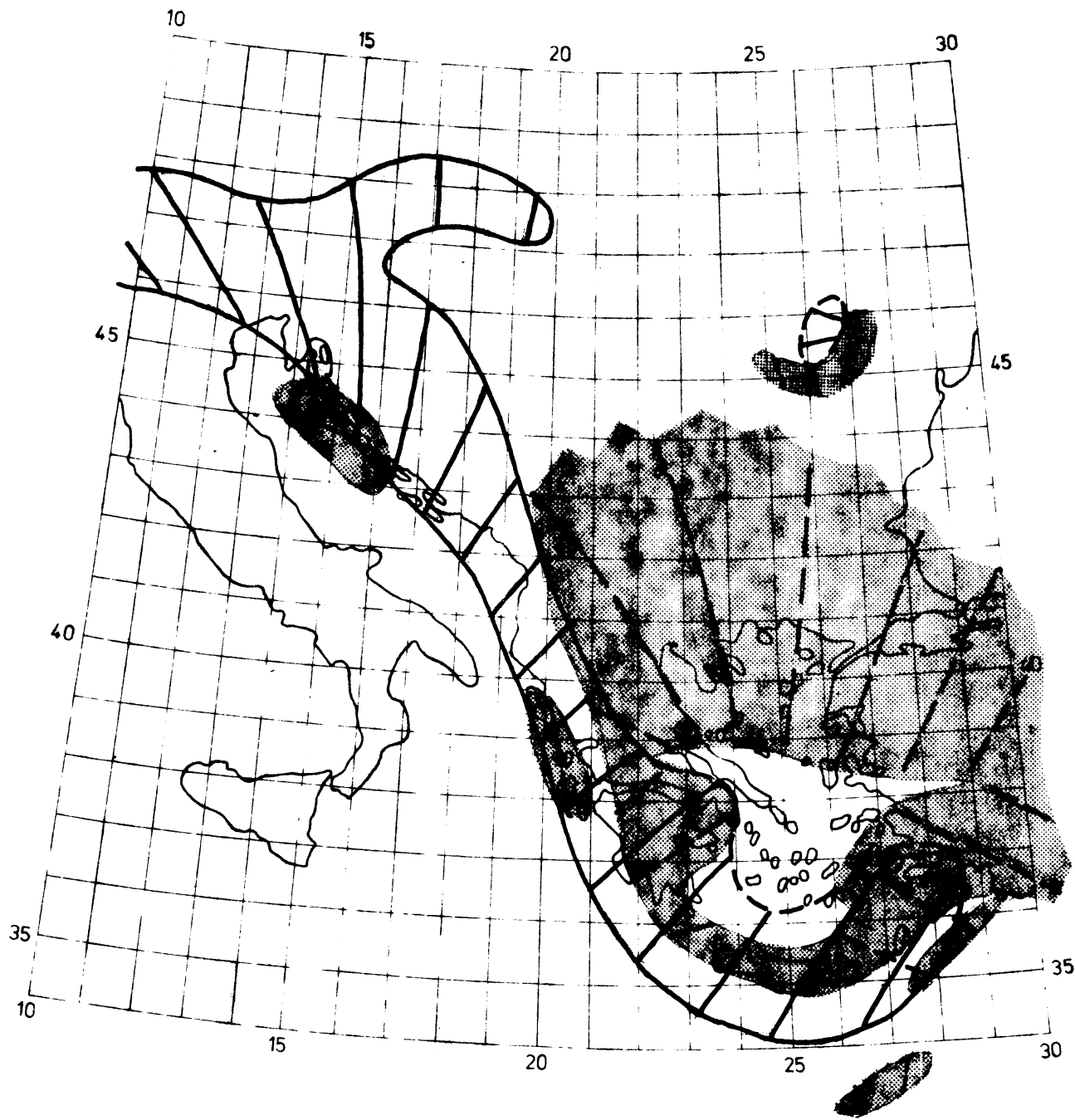


Figure 26. The generalized stress pattern in the Balkan region.
 Solid lines : the compressional regime with the direction of P-axes,
 contours are dashed for subcrustal events.
 Dotted field : the tensional regime with the direction of T-axes.

CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS
OF THE BALKAN REGION

- Part I : The earthquake mechanism solutions
of quality A or B in chronological
order
- Part II : The earthquake mechanism solutions
of quality C or D in chronological
order
- Part III: Regional lists of quality A/B and
of quality C/D solutions in
chronological order

=== BALKAN PROJECT === CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ===== KNM1731210 = 82 ==
 --- PART 1 : QUALITY A AND B SOLUTIONS IN CHRONOLOGICAL ORDER ---

1	5	10	15	20	25	30	35	40	45	50	55	60	65	70
710811	0537287*	3696	N	2391	E	368	120	49						
710811	0537287*	3696	N	2391	E	368	120	49	42	23037	33418	08448	6504	17172 00 2107 B
710909	1510033	3730	N	3024	E	366	923	53	42	01010	27812	14074*	18034	02454 02 02206 B
711013	0326271	3426	N	2609	E	370	27	51	84	08530*	17500	26560	08575	26515 11 02303 B
711217	0206052	3496	N	2397	E	370	33	47	99	14536	04612	30051	19376	31407 11 02804 A
									60	05510*	14817	29670	29033	03552 02 01201 B
720416	1010035*	4773	N	1612	E	546	918	49						
720416	1010035*	4773	N	1612	E	546	918	49	43	11500	02570	20520	15814	25214*23 01401 B
720426	0630239	3950	N	2635	E	366	926	50	43	07020	18616	29064	04562	26222*11 01401 B
720426	1559450*	3951	N	2634	E	366	928	48	78	06017	30058	15826	10631	20006 13 02305 B
720426	1559450*	3951	N	2634	E	366	928	48	73	33512	28063	07024	11408*	02025 04 01404 B
									73	31541	21115	10545	12102*	02474 00 01602 B
720429	1829382	3481	N	2463	E	370	47	51						
720504	2140009*	3512	N	2361	E	370	46	59	102	08238	32340	19736	23004	12650 00 02202 B
720504	2140009*	3512	N	2361	E	370	46	59	63	100	06620	18625	30156	26620 03197 02 05003 A
720508	0920345*	4164	N	2353	E	363	910	50	63	100	4809	14008	27378	23636 3953 02 133
720508	0920345*	4164	N	2353	E	363	910	50	57	10505	01500	28585	28540*	10550 02 01701 B
									57	15500	06370	24520	29214*	19814 24 01701 B
730105	0549175	3581	N	2183	E	400	33	53	51	109	4030	38510	20058	21315 6775 00* 3805 B
730126	0750128	3582	N	2210	E	400	58	47	60	6030	15000	24060	24015	6075 00 1303 B
730406	1413541	3443	N	2525	E	370	916	51	89	3027	18000	21063	21018	3072 00 2401 B
730714	1238183	3790	N	2107	E	368	936	47	59	7515	33923	19562	23726	10454 02 1303 B

=== BALKAN PROJECT === CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ===== KNMI731210 = S2 ==
 --- PART 2 : QUALITY C AND D SOLUTIONS IN CHRONOLOGICAL ORDER ---

1	5	10	15	20	25	30	35	40	45	50	55	60	65	70			
280327	083228	464	N	130	E	546	920	58	73	16535	24007	00054	35108	13178	00	1100	C
291101	065721	459	N	266	E	358	198	5	75	8030	34214	23056	24914	11670	00	1201	C
330423	055738	368	N	273	E	369	90	54	133							8	
330511	190944	405	N	237	E	364	915	63	109	12200	3280	21210	24807	16607	24	900	C
330719	200710	382	N	297	E	366	100	60	64							7	
341109	134056	3675	N	2575	E	369	140	63	71							7	
341130	025819	441	N	140	E	382	930	56	54	12000	21070	3020	34317	7714	23	2409	C
350223	025137	358	N	250	E	370	80	71	130	18020	8221	31060	34421	21260	02	1700	C
350318	084044	355	N	270	E	369	130	65	72	23928	14500	5570	5525	23565	02	1401	C
350713	000348	460	N	265	E	358	150	53	49	12300	3300	90	30345	12345	22	1000	C
360613	003237	327	N	225	E	400	9	50	54							6	
361019	070554	460	N	125	E	545	910	45	23	2400	90	11400	15900	6900	24	1103	C
371216	173527	350	N	235	E	370	100	63	70	6308	90	15300	1800	10800	24	900	C
380327	111624	462	N	168	E	383	9	56	69	22010	18000	4080	4035	22055	02	700	C
380720	002335	383	N	238	E	364	913	61	89	23316	32942	12843	19043	8516	12	1300	C
380918	035028	380	N	225	E	364	100	62	76	19050	10000	1040	1085	19005	11	801	C
390803	123247	398	N	296	E	366	912	55	51	6428	34738	17545	10848	21515	11	900	C
390809	234344	398	N	296	E	366	915	51	33	1921	27034	13048	5852	16916	11	400	C
390915	231626	398	N	296	E	366	916	57	70	1921	27034	13048	5852	16916	11	1204	C
390920	001926	380	N	215	E	364	80	58	68	5920	30840	16543	20614	10047	00	600	C
390922	003632	390	N	269	E	366	920	66	101	1039	28715	16047	7074	17605	11	1200	C
400106	190433	357	N	259	E	370	916	56	50	24922	449	14032	19640	10006	14	700	C
400229	160744	357	N	259	E	370	932	60	92	4015	13080	22075	22030	4060	02	1502	C
400816	160223	357	N	308	E	371	940	55	42	24048	18000	6050	6005	24085	00	700	C
400816	182312	357	N	308	E	371	925	52	39	24048	18000	6050	6005	24085	00	1000	C
401108	120044	457	N	262	E	358	100	53	21							2	D
401111	063417	460	N	268	E	358	150	50	36	12634	3404	29856	30311	14078	00	600	C
410301	035247	395	N	225	E	364	915	62	73	15008	24065	6025	10818	1218	24	1301	C
410514	083620	393	N	224	E	364	915	53	48	6000	18000	90	6045	24045	22	600	C
410523	195152	372	N	283	E	366	9	60	67							11	
410523	223409	372	N	283	E	366	910	53	44							5	
410713	153928	376	N	258	E	369	915	59	58	6025	18000	24065	6070	24020	11	701	C
420616	054827	404	N	280	E	366	915	56	43							7	
420621	043834	364	N	274	E	369	130	64	47							1100	D
420827	061411	416	N	205	E	391	912	60	59	6008	15000	90	24045	6045	22	700	C
430120	123819	432	N	144	E	383	927	53	29							6	
431016	130846	364	N	279	E	369	110	66	69							16	D
440108	074404	364	N	274	E	369	916	56	36							7	D
440527	235225	372	N	283	E	366	100	62	32							8	D
441006	023441	394	N	267	E	366	920	68	90	8008	38070	17020	12314	21714	23	801	C

=== BALKAN PROJECT === CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ===== KNMI731210 = S2 ==
 --- PART 2 : QUALITY C AND D SOLUTIONS IN CHRONOLOGICAL ORDER ---

1	5	10	15	20	25	30	35	40	45	50	55	60	65	70			
450312	205147	457	N	268	E	358	150	58	28							601	D
450902	115405	344	N	289	E	371	80	64	76	13045	4000	31045	13000	90	00	800	C
460221	154304	383	N	318	E	366	9	56	58							12	
460405	205358	351	N	234	E	370	100	57	63	6914	18900	24976	24931	6959	02	1300	C
460716	052626	338	N	253	E	371	915	57	82	5518	14500	23580	23535	5555	02	1000	C
470601	111835	366	N	215	E	368	917	55	64	9014	000	27076	27031	9059	22	600	C
470707	223538	372	N	208	E	399	100	62	52							7	D
470830	222131	351	N	234	E	370	915	64	99	15008	24083	6007	1505	10505	23	1500	C
471006	195534	369	N	220	E	368	925	69	137	11723	34955	21824	16835	25801	13	901	C
480209	125813	355	N	272	E	369	930	71	151	10028	1000	28062	10073	28017	11	2203	C
480422	104245	388	N	206	E	364	913	66	125	5000	14000	90	23045	5045	22	900	C
480650	122113	388	N	206	E	364	916	64	108	35833	14232	23540	20504	30157	00	1501	C
480827	104406	417	N	195	E	391	911	55	61	6500*	90	15500	2000	11000	24	1101	C
481010	174301	351	N	234	E	370	915	57	78	24017	15000	6073	24062	6028	12	801	C
481018	085953	355	N	272	E	369	915	55	58	32020	5000	13070	13025	32065	02	1400	C
500923	062340	348	N	256	E	370	9	53	98							8	D
510824	102726	373	N	213	E	368	9	49	76							700	D
510831	122987	355	N	228	E	400	915	55	107							9	
511001	012833	345	N	265	E	370	915	50	79							5	
520319	012723	398	N	287	E	366	926	54	126	16000	7070	25020	29714	20314	24	1405	C
520603	055322	457	N	268	E	358	922	45	49	28036	2418	13548	11606	22471	00	800	C
520642	110008	348	N	262	E	370	9	45	39							9	
520643	010722	373	N	221	E	368	9	47	71							10	D
520902	232007	372	N	216	E	368	9	46	17							5	
521005	105496	375	N	208	E	399	924	56	128							14	
521013	164227	388	N	232	E	364	9	50	64							600	D
521022	041495	367	N	279	E	368	915	52	42							7	
521231	171848	355	N	257	E	370	912	52	112							7	
530207	223105	347	N	241	E	370	9	53	152	25328	16500	7570	7525	25565	02	1904	C
530214	084313	355	N	265	E	370	60	57	132	4908	13500	90	22545	4545	22	1603	C
530603	160524	401	N	288	E	366	9	53	70							10	
530618	054406	417	N	266	E	363	917	51	120	9030	000	27060	9075	27015	11	1000	C
530623	015310	357	N	293	E	370	100	61	73	5010	14000	23080	23035	9055	02	902	C
530722	190933	391	N	285	E	366	925	52	93							6	
530812	113346	383	N	208	E	364	910	53	73							10	
530812	133920	380	N	210	E	364	33	52	78	5000	14000	90	23045	5045	22	3206	C
530812	160830	380	N	210	E	364	910	51	71	4200	31248	13242	18628	7828	24	2606	C
530813	032204	381	N	208	E	364	33	52	71	20807	38545	11144	16936	6223	14	2309	C
530914	145614	383	N	208	E	364	9	53	81	6514	15500	24576	24531	6559	02	800	C
531021	113101	383	N	208	E	364	914	54	87	5015	14000	23075	23030	5060	02	701	C

=== BALKAN PROJECT === CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ===== KNMI731210 = S2 ==
 --- PART 2 : QUALITY C AND D SOLUTIONS IN CHRONOLOGICAL ORDER ---

1	5	10	15	20	25	30	35	40	45	50	55	60	65	70
620404	205937	3426	N	2511	E	370	42	47	57	102				
620404	205937	3426	N	2511	E	370	42	47	57	102				15 D
620411	104730	3767	N	2011	E	399	920	53	57	169	13822	26052	3730	9038 35705 14 10
620416	001522	3780	N	2063	E	399	103	50	100		6110	15100	24180	6155 24135 12 01910 C
620417	100342	4212	N	1720	E	382	10		55	127	5510	14817	29570	25034 3652 02 2507 C
620417	113351	3772	N	1995	E	399	20	51	103					
620908	235357	3519	N	2417	E	370	85		55	88				11
620628	065106	4082	N	2072	E	392	38	50	55	112				11
620830	074600	455	N	267	E	358	100		49		26025	16304	6764	7220 26470 00 1501
621004	194609	3787	N	2235	E	368	43		52	145	17740	6623	31441	24468 33601 11 2006 C
621026	112607	3355	N	2762	E	371	100		52	108	15037	6000	33053	15082 33008 11 2209 C
621109	021452	458	N	267	E	358	130		47		4242	14413	24745	32877 23401 11 1701
630131	150704	3592	N	2186	E	400	62	49	78		4030	28240	15536	9550 18904 11*01302 D
630214	131857	4433	N	1512	E	383	950	51	85		14920	2850	24832	19339 28908 13 01701 C
630215	101826	4035	N	1970	E	391	41		46	82	000	9080	27010	22407 31607 23 00700 D
630221	171431	3249	N	2097	E	400	10		56	174	5912	31248	15540	20118 9737 04 3907 C
630221	202639	3266	N	2110	E	400	0		88					10
630222	141254	4040	N	2000	E	391	44		52	123	12700	3785	21705	17204 26204 23 01302 D
630317	141723	3940	N	2082	E	392	956	47	102		12530	3500	30560	12575 30515 11 01702 C
630423	140258	4203	N	1960	E	383	54	46	71					12
630515	111544	4172	N	2006	E	391	29		44	88				12
630604	221130	3893	N	2051	E	364	9	8	47	100	3008	90	12000	7500 16500 23 01503 C
630708	160231	3646	N	2803	E	389	57	47	90					11
630924	021041	4085	N	2888	E	386	10	47	86					16
631002	210512	3483	N	2346	E	370	56	45	74		5500	14500	90	23545 5545 22 1501 C
631112	070632	3538	N	2964	E	371	73		50	106				18
631202	064905	4803	N	1620	E	546	9	0	82		27020	080	9070	9025 27065 02 01403 C
631216	134753	3704	N	2102	E	368	940	56	181		18044	5000	046	001 18089 00*03218 C
640223	2241039	3921	N	2373	E	365	10	54	53		131	6520	16933	31050 27118 2451 00*02112 C
640318	1643206	4554	N	1435	E	383	20	47	45					7
640425	1244150	3546	N	2770	E	369	61	48	67					11
640429	1700013	3914	N	2355	E	365	915	50	99		7010	16000	25080	7055 25035 12 1503 C
640630	1229590	4773	N	1592	E	546	9	3	48		200	90	9200	4700 13700 23 01303 C
640817	0017485	3928	N	2590	E	370	14	46	95					11
640825	1111520	3575	N	2884	E	371	51	48	55	125	8028	33044	18840	12644 22912 11 2102 C
640827	1931597	3556	N	2884	E	371	38	48	54	113	14500	5500	90	14545 32545*22 01600 C
640918	0008476	3569	N	2907	E	371	40	47	52	95	4500	13330	31560	29238 1838 23 1100 C
641013	1842	421	N	215	E	383	4				33510	7540	23050	29540 18020 12 5 D
641017	0950280	3502	N	2543	E	370	918	48	117					14
641022	2330	421	N	215	E	383	10				15035	4520	29050	20070 31505 11 5 D

=== BALKAN PROJECT === CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ===== KNMI731210 = S2 ==
 --- PART 2 : QUALITY C AND D SOLUTIONS IN CHRONOLOGICAL ORDER ---

1	5	10	15	20	25	30	35	40	45	50	55	60	65	70
641024	1509	421	N	215	E	383	5							
641027	1946091	4785	N	1595	E	546	9	1	54		19505	18515	30075	040 21050 02 5 D
650206	0347578	3541	N	2704	E	369	71	49	59		88	14525	5448	29340 19636 30120 13 02903 C
650304	0831	421	N	215	E	383	3							10
650309	1837546	3928	N	2393	E	365	33	51	85		23010	33050	13040	8520 19035 03 5 D
650310	0136058	3908	N	2377	E	365	18	90	59	101	18408	28877	09113	4706 13813 03 25
650313	0408408	3911	N	2397	E	365	11	48	59	62	23724	33720	10258	20263 7319 11 11
650313	0409379	3903	N	2368	E	365	33	51	78					11
650326	2029226	3682	N	3094	E	366	111	50	67		26534	17007	7055	29678 7910 11 02402 C
650326	2029226	3682	N	3094	E	366	111	50	67		15500	24545	6545	1030 12030 22 02303 C
650403	1430482	3824	N	2050	E	364	25	49	66					10
650410	0019597	3490	N	2437	E	370	55	47	47					16
650511	2236004	4583	N	2686	E	358	94	46	38					9
650516	0135560	3526	N	2785	E	369	41	46	80					11
650603	1831510	3972	N	2321	E	365	933	48	107		19040	29922	5042	2901 12269 00 01202 C
650617	0258250	3777	N	2936	E	366	937	47	84		25310	13271	34616	3004 29819 04 01301 C
650629	1540315	3420	N	2623	E	370	33	46	67					15 D
650804	1915046	353	N	265	E	370	52	46	35					7
650825	0487457	3472	N	2508	E	370	910	48	95		16810	6649	26639	20935 30320 13 01801 C
651102	0327074	3948	N	2532	E	365	9	5	47	56	94	010	9000	18080 055 18035 12 01202 C
651204	1639575	3426	N	2625	E	370	912	48	68					7
660102	231218	3767	N	2318	E	368	912	50	92		4234	13200	22256	22211 4279 00*01303 C
660114	183931	3472	N	2700	E	371	22	45	54					13
660115	1807465	3672	N	2309	E	368	37	47	60					10
660116	2013300	3561	N	2580	E	370	47	46	73		34020*	7615	20065	17224 31762 02 01102 C
660118	2020270	4585	N	2677	E	358	93	47	51					11
660118	2120026	3512	N	2349	E	370	60	45	47					13
660120	0039006	3920	N	2444	E	365	12	44	49					8
660122	0023443	3765	N	2995	E	366	32	48	85		26832	2132	14542	11406 21358 00 01102 C
660204	083803	3437	N	2394	E	370	33	47	94		8508	38316	20072	10350 29236 12 01402 C
660208	1316222	3623	N	2811	E	369	979	46	62		29510	3236	19252	14326 26043 02 01002 C
660208	200804	4108	N	2497	E	363	921	47	105		24307	38974	15115	19916 10605 14 02307 C
660208	200804	4108	N	2497	E	363	921	47	105		17004	8000	35086	17049 35041 12 02307 C
660308	1851475	3887	N	2142	E	364	44	47	65					8 D
660314	1408412	3907	N	2136	E	364	45	46	62		31010	4738	20850	27342 15825 12 00900 C
660401	131505	3872	N	2149	E	364	45	47	91					15 D
660407	032545	3783	N	2114	E	368	925	48	106		18015	9000	00075	18060 00030 12 01504 C
660414	1851444	3455	N	2386	E	370	914	48	83		35037	8607	18552	17708 31080 00*01301 C
660421	0645269	3449	N	2569	E	370	51	50	99					20 D
660428	1147339	3889	N	2128	E	364	53	43	48					8

=== BALKAN PROJECT === CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ===== KNM1731210 = S2 ==
 --- PART 2 : QUALITY C AND D SOLUTIONS IN CHRONOLOGICAL ORDER ---

1	5	10	15	20	25	30	35	40	45	50	55	60	65	70				
660510	024748		3438	N	2651	E	370	64	44									
660511	1506025		3437	N	2642	E	370	39	47	30				6				
660513	1311509		3447	N	2647	E	370	37	46	92	12530	24440	1036	33704	7150	00	01202	C
660515	101108		3517	N	2716	E	369	34	45	86	15500	24584	6506	2004	11004	23	00900	C
660516	1730561		3448	N	2646	E	370	41	46	61	16520	6428	28554	20455	32370	12	00600	D
660522	073729		3870	N	2792	E	366	23	51	91	18040	28921	4043	11269	2001	11	01102	C
660524	0939265		3733	N	2189	E	368	934	48	57								6
660524	0939265		3733	N	2189	E	368	934	48	128	11021	535	22548	15352	26416	11	02103	C
660524	1743323		3487	N	2462	E	370	43	47	128	7916	32464	17520	12626	21803	13	2203	C
660525	090657		4032	N	1982	E	391	921	50	63	2000	11020	29070	142	21942	22	00600	D
660605	0914068		3907	N	2934	E	366	36	44	82	6013	31940	16548	9034	21021	12	01302	C
660611	0212554		3884	N	2150	E	364	43	47	52								10
660619	175330		3855	N	2735	E	366	919	47	109	8505	20178	35410	4011	30904	14	01505	C
660720	101606		3883	N	2139	E	364	922	45	82	4525	28745	15435	19106	9545	00	01301	C
660806	023103		4218	N	1879	E	383	9	3	64								11
660806	0552018		4230	N	1895	E	383	48	48	141	5525	14500	23565	5570	23520	11	02715	C
660806	183232		3790	N	222	E	368	25	44	79								16
660809	0334151		4022	N	1986	E	391	38	49	43								8
660810	1922402		3640	N	2222	E	368	39	46	92	21920	31050	7565	4823	19162	02	01303	C
660811	0023408		3765	N	2099	E	399	48	46	80	23030	12820	1053	3412	27266	00	01201	C
660811	043413	*	3874	N	2176	E	364	9	6	73	10500	1900	90	28545	10545	22	01003	D
660811	043413	*	3874	N	2176	E	364	9	6	84	5010	14000	23080	23035	5055	02	1102	C
660818	2209012		3622	N	2635	E	369	133	44	84	14310	4443	24345	18239	29122	12	01201	D
660820	1205193		4218	N	1865	E	383	933	54	43	14500	5570	23520	18814	28214	23	1201	C
660820	1908218		4210	N	1879	E	383	42	47	76	35515	12267	26018	30824	21702	14	01406	C
660828	041811		4215	N	1875	E	383	922	46	77	7040	18000	25050	25005	7085	00	01002	C
660904	0129292		4577	N	2663	E	358	130	43	54	9500	515	18575	28043	11043	22	01201	C
660906	1231573		3666	N	2663	E	369	158	45	28								11
660910	1055167		3653	N	2690	E	369	146	45	33								11
660924	2021175		3806	N	2215	E	364	71	44	45								11
661021	1617040		3953	N	2211	E	364	957	46	64	16000	7000	90	16045	34045	22	02000	C
661029	1213068		3474	N	2754	E	371	64	46	42								9
661030	021014		3875	N	2158	E	364	26	47	72								12
661218	074220		3510	N	2692	E	370	33	47	88								10
661229	0630024		4554	N	2648	E	358	123	43	43	6827	17022	29554	26615	2763	00	1101	C
670209	1408182	*	3992	N	2026	E	392	1	56	207	5217	31135	16450	20620	9348	02	5525	
670209	1408182	*	3992	N	2026	E	392	1	56	207	16040	08110	32048	33104	22080	00	05925	C
670209	1408182	*	3992	N	2026	E	392	1	56	207	12736	02121	26746	28905	18669	00	05624	C
670227	210042		4486	N	2669	E	358	932	50	103	09720	33753	19929	14536	23908	*13	01504	C
670228	1421513		3753	N	2118	E	368	46	47	85								14

=== BALKAN PROJECT === CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ===== KNM1731210 = S2 ==
 --- PART 2 : QUALITY C AND D SOLUTIONS IN CHRONOLOGICAL ORDER ---

1	5	10	15	20	25	30	35	40	45	50	55	60	65	70						
670304	1838010		3899	N	2480	E	365	15	47	55										
670328	000428		3844	N	2542	E	365	29	46	76				10						
670404	1806067		4572	N	2632	E	358	161	45	50				00901	D					
670503	1841472		3953	N	2134	E	364	37	48	117	34028	7716	20062	31263	17421	11	01002	C		
670504	1331078		3963	N	2126	E	364	39	47	72	6505	32830	16360	22033	9442	02	1101	C		
670505	0626379		3950	N	2129	E	364	57	47	80								17		
670526	1733006		4543	N	2617	E	358	163	43	39								7		
670530	2353316		3417	N	2867	E	371	35	45	59								16		
670611	0535050		3814	N	2291	E	364	40	45	71								10		
670612	0129095		3808	N	2290	E	364	47	46	78								11		
670612	1812466		3906	N	2127	E	364	46	46	72								11		
670703	025343		4402	N	1918	E	383	9	1	70								15		
670705	0053168		3673	N	2150	E	368	50	47	140	21324	32337	9843	16551	6111	12	01503	C		
670713	1438584		4066	N	1967	E	391	73	47	62								8		
670719	0906222		3810	N	2887	E	366	41	48	105	2000	29056	11034	16023	6023	24	01706	C		
670720	1903304		4072	N	1988	E	391	58	45	58								11		
670722	1748065		4066	N	3062	E	366	26	50	104	10010	21567	620	5522	322	7	14	01802	C	
670722	1809554		4072	N	3051	E	366	35	50	97	16530	5630	29045	21659	32109	11	01102	C		
670722	203540		4079	N	3042	E	366	4	47	67								15		
670722	2341598		4064	N	3053	E	366	930	47	98	3030	27339	14537	8451	17905	11	01301	C		
670723	0403396		4061	N	3035	E	366	21	45	59								12		
670726	091606		4061	N	3067	E	366	21	44	69								14		
670804	145432		4281	N	1762	E	382	22	46	66								11		
670814	200925		4074	N	3037	E	366	925	46	68	14000	5000	90	14045	32045	22	1301	C		
670815	0435529		3654	N	1928	E	400	33	46	51								12		
670906	045923		3506	N	2309	E	370	20	48	104								18		
670908	020445		4060	N	2008	E	392	9	1	110	18045	9000	36045	00000	90	00	01906	C		
670912	144642		3923	N	2146	E	364	25	47	56								13		
670924	2211204		4086	N	1970	E	391	35	46	74	24510	33817	12370	22552	7933	12	1100	C		
670927	072434		3442	N	2660	E	370	49	46	80	6020	15410	27067	24924	4363	02	1202	C		
671118	023136		3525	N	2305	E	370	34	46	97								13		
671126	0324974		3940	N	2049	E	392	37	49	51	8008	34629	18560	23731	11945	02	1300	C		
671202	1244427		4132	N	2029	E	391	916	53	172	250	8	14167	34322	29422	28	9	13	03713	C
671209	0309560		4200	N	1641	E	382	66	46	83								11		
671219	0832323		4149	N	2043	E	391	929	49	110	22604	12572	31718	27016	310	13	02003	C		
671221	000940		4216	N	2062	E	383	926	46	71	24522	35642	13540	19846	9611	11	1302	C		
671229	1949241		4141	N	2027	E	391	946	48	101	6827	30250	17328	12040	21001	13	02205	C		
680106	1023505		4576	N	2646	E	358	173	46	100	07023	31841	18140	11847	21910	11	02708	C		
680109	2315428		3552	N	2254	E	400	46	47	69	24515	461	14824	19928	10506	14	1403	C		
680220	0039157		3973	N	2537	E	365	937	50	88	34538	23920	12845	04770	14804	11	01105	C		

=== BALKAN PROJECT === CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ===== KNMI731210 = S2 ==
 --- PART 2 : QUALITY C AND D SOLUTIONS IN CHRONOLOGICAL ORDER ---

1	5	10	15	20	25	30	35	40	45	50	55	60	65	70
700415	162958	3934	N	2930	E	366	928	46						
700416	1143223	3898	N	2995	E	366	943	48	94	29010	3860	19528	15013	24628 03 1500 C
700416	2239313	4067	N	2345	E	364	920	49	86	5030	30228	17847	9960	20710 11 1202 C
700416	2239313	4067	N	2345	E	364	920	49	159	27506	15478	610	5301	32012 04 2306 C
700420	1539316	3827	N	2268	E	364	938	51	159	11530	22024	34250	6963	31511 11 2207 C
700423	0718318	3894	N	3001	E	366	932	49	193	7015	32446	17340	11340	21716 13 3310 C
700424	1117122	3991	N	1961	E	392	41	43	129	19520	18500	1570	19565	1525 12 1906 C
700427	0154126	3894	N	2981	E	366	937	44	46	2040	27715	17046	8874	18603 11 1200 C
700427	222443	3906	N	2954	E	366	911	47	86	16012	28066	6620	11423	2205 14 1500 C
700430	235909	3909	N	2959	E	366	929	45	112	16500	7500	90	16545	34545 22 1703 C
700508	0249146	3893	N	2998	E	366	20	46	80	2030	11080	20060	2075	20015 11 1707 C
700512	2249032	3821	N	2255	E	364	939	48	109					20
700819	0201530	4110	N	1977	E	391	933	52	146	21040	12000	3050	21085	3005 11 1708 C
700825	0140095	4329	N	1841	E	383	910	52	101	05005	14000	23085	23040	05050 02 01002 C
701001	2221549	3813	N	2276	E	364	924	47	40	15200	24285	06205	01704	10704 23 00803 C
701001	2238352	3804	N	2279	E	364	929	50	33	16518	29060	06723	02503	11830 03 00700 C
701111	2058132	3612	N	2821	E	369	43	49	55	17808	28968	08520	04008	13320*03 01303 C
710103	2318412	3467	N	2634	E	370	932	52	55	06400	33450	15440	20727	10127 24 01402 C
710119	2333567	3440	N	2401	E	370	933	48	76	03319	28550	13437	17814	08537 04 02107 C
710215	0819561	3917	N	2940	E	366	928	49	63	07404	16400	25486	25441	07449 02 01201 C
710419	0243521	3895	N	2049	E	364	916	51	71	26510	08543	16545	11722	22639*02 01102 C
710512	2013081	3749	N	2988	E	366	936	48	53	11530	00136	23540	26706	16854 00 01202 C
710513	0449274	3746	N	2974	E	366	914	48	63	21227	33647	10530	15943	06802 14 01503 C
710514	2218230	3767	N	3000	E	366	933	45	52	11310	34474	20512	24902	15916 04 02101 C
710516	0929014	3757	N	2974	E	366	933	49	36	15030	28840	03536	09550	00104 11 00701 C
710517	1418179	3767	N	2988	E	366	933	48	44	14528	05500	32562	14573	32517 11 00901 C
710608	1859248	3752	N	2977	E	366	910	47	59	00500	27565	09525	04718	14318 23 01201 C
710615	2255455	3705	N	2896	E	366	933	46	47	18335	09300	00355	00310	18380 00 01002 C
710628	2337399	3755	N	2982	E	366	9	49	35	00500	90	09500	05000	14000 23 00801 C
710629	0426311	3746	N	2989	E	366	928	49	33					8
710718	1618227	4571	N	2631	E	398	137	46	37	26018	14567	35420	03907	30522 04 00900 C
710921	1648516	3727	N	3016	E	366	37	48	58	09000	18070	02000	04714	31314*24 01001 C
710928	0510248	3712	N	3011	E	366	36	47	56	13025	28138	01542	08250	33910 12 00802 C
711106	1943468	3902	N	2973	E	366	914	50	42	04032	16039	28535	29202	34551*00 01602 C
720112	1351201	3499	N	2347	E	370	48	49	55	29042	04009	11558	25173	10215 11 01301 C
720206	0134224	4401	N	1319	E	382	9	49	40					9
720228	1052437	3698	N	2416	E	368	11	48	53	10530	21935	34640	09254	31306 14 01101 C
720314	1405458	3928	N	2942	E	366	33	54	43	02026	27921	15555	06063	18316 11 01402 C

=== BALKAN PROJECT === CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ===== KNMI731210 = S2 ==
 --- PART 2 : QUALITY C AND D SOLUTIONS IN CHRONOLOGICAL ORDER ---

1	5	10	15	20	25	30	35	40	45	50	55	60	65	70
720331	0258024	3646	N	2122	E	368	9	47	63					11
720331	2032008	3662	N	2714	E	369	18	45	40					8
720416	0003316	4553	N	2644	E	358	136	46	36	32515	28115	09869	13328	34658 00 00802 C
720416	1104442	4773	N	1602	E	546	919	44	49	14512	28862	05025	00508	10027 03 00900 C
720615	0033236	3834	N	2220	E	364	926	49	87	06540	15500	24550	24505	06585 00*01402 C
720913	0413205	3793	N	2239	E	368	83	60	158	14211	24855	4533	36014	9931 03 123
720917	1407156	3828	N	2034	E	364	33	56	63	114	30607	5569	21420	26219 16909 14 82
721030	1432131	3833	N	2037	E	364	933	53	92	04609	29764	14024	18410	09024 04 01300 C
721120	0330278	3940	N	2180	E	364	933	49	38	25615	00651	15535	11213	21137 30 00701 C
721124	0348351	3951	N	2034	E	392	911	53	71	10500	01565	19525	14718	24318 23 01601 C
721219	1934314	3548	N	2781	E	369	54	46	65					14
730116	2245166	3514	N	2256	E	400	28	45	58	3010	18000	21080	21035	3055 02 1001 C
730312	2030438	3591	N	2178	E	400	44	47	55	5700	14720	32770	25542	3942 22 900 C
730422	1339461	3518	N	2339	E	370	56	45	31	7030	18000	29060	25015	7075 00 1100 C

=== BALKAN PROJECT === CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ===== KNMI731210 = S2 ==
 PART 3 : REGIONAL LISTS OF QUALITY A/B AND QUALITY C/D SOLUTIONS IN CHRONOLOGICAL ORDER

1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	
690813	040603	3837	N	2175	E	364	24	45	66						
700416	2239313*	4067	N	2345	E	364	920	49	159	27506	15478	610	5301	32012 04 2306 C	
700416	2239313*	4067	N	2345	E	364	920	49	159	11530	22024	34250	6963	31511 11 2207 C	
700420	1539316	3827	N	2268	E	364	938	51	193	7015	32446	17340	11340	21716 13 3310 C	
700512	2249032	3821	N	2255	E	364	939	48	146	21040	12000	3050	21085	3005 11 1706 C	
701001	2221549	3813	N	2276	E	364	924	47	33	16518	29040	06723	02503	11870 03 00700 C	
701001	2238352	3804	N	2279	E	364	929	50	55	17808	28968	08520	0408	13320*03 01303 C	
710419	0243521	3895	N	2049	E	364	916	51	53	11530	08136	23540	26706	16854 00 01202 C	
720615	0032326	3834	N	2220	E	364	926	49	87	06540	18500	24550	24505	06585 00*01402 C	
720917	1407156	3828	N	2034	E	364	33	56	63	114	30607	5569	21420	26219 16 82	
721030	1432131	3833	N	2037	E	364	933	53	92	04609	29764	14024	18410*09024	04 01300 C	
721120	0330278	3940	N	2180	E	364	933	49	36	25615	00651	15535	11213	21137 30 00701 C	
470604	002955	400	N	240	E	365	80	62	69	6518	33016	20065	23225	8859 02 1601 B	
490723	150330	386	N	263	E	365	920	66	140	15020	27457	5025	10033	903 14 3914 B	
490723	150330	386	N	263	E	365	920	66	140	5822	29355	16026	10736	20003 13 4013 B	
540803	181813	401	N	245	E	365	935	58	120	28408	1400	10482	10437	28453 02 3087 B	
550419	164719	393	N	231	E	365	9	61	145	17129	28233	5144	12156	1808 11 5510 A	
550421	071818	393	N	231	E	365	9	58	135	17527	28331	5347	12857	2011 11 4508 A	
580116	041815	3951	N	2545	E	365	9	56	113	31310	18773	4514	35917	9003 13 1703 B	
640411	160043	4030	N	2483	E	365	933	54	55	136	32020	28648	6535	10610	841 03 02205 B
640411	160043	4030	N	2483	E	365	933	54	55	136	32020	19557	6025	10103	933 04 2205 B
640429	0421051	3925	N	2372	E	365	920	54	137	14004	24877	4912	9512	405 14 02607 B	
650309	1757545	3934	N	2382	E	365	918	57	63	215	17516	8500	35574	17561	35529 12 06811 B
651220	0008160	4021	N	2382	E	365	18	57	63	215	5101	31675	14115	9511	18710 13 110
670304	1758090	3925	N	2482	E	365	933	52	59	175	10000	1064	19026	23818	14218 24 02903 B
670304	1758090	3925	N	2460	E	365	60	60	65	329	02541	12207	22048	32882	2120*411*10623 B
680219	2248424	3940	N	2460	E	365	960	60	65	329	33028	08942	21835	27648	1820*411*10821 B
680424	0818033	3933	N	2468	E	365	9	70	70	333	20905	32579	11810	07304	16411 03 08915 A
690406	0349339	3847	N	2641	E	365	916	56	55	229	24207	35572	15016	10506	19717 03 06208 A
550602	233433	404	N	258	E	365	910	53	78						7
561102	160433	3932	N	2309	E	365	910	52	93	25030	1142	13734	19548	10302 11 1405 B	
591119	140028	3891	N	2659	E	365	910	52	103	4524	28350	15030	9540	18904 13 1000 C	
640223	2241039	3921	N	2373	E	365	10	54	53	131	6520	16933	31050	27118	2451 00*02112 C
640429	1700013	3914	N	2355	E	365	915	50	99	7010	16000	25080	7055	25035 12 1503 C	
650309	1837546	3920	N	2393	E	365	33	51	85						10
650310	0136058	3908	N	2377	E	365	18	50	59	101	18402	28877	09113	4706	13813 03 25

=== BALKAN PROJECT === CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ===== KNMI731210 = S2 ==
 PART 3 : REGIONAL LISTS OF QUALITY A/B AND QUALITY C/D SOLUTIONS IN CHRONOLOGICAL ORDER

1	5	10	15	20	25	30	35	40	45	50	55	60	65	70		
650313	0408406	3911	N	2397	E	365	11	48	59	62	23724	33720	10258	20263	7319 11 11	
650313	0409379	3903	N	2368	E	365	33	51	78						11	
650603	1831510	3972	N	2321	E	365	933	48	107	19040	29922	5042	2901	12269 00 01202 C		
651102	0327074	3948	N	2532	E	365	9	47	56	94	010	9000	18080	055	18035 12 01202 C	
660120	0039006	3920	N	2444	E	365	12	44	49						8	
670304	1838010	3899	N	2480	E	365	15	47	55						10	
670328	000428	3844	N	2542	E	365	29	46	76						00901 D	
680220	0039157	3973	N	2537	E	365	937	50	88	34538	23920	12845	04770	14804	11 01105 C	
680220	023132	3956	N	2545	E	365	9	8	50	90	11218*02200	29272	11263	29227	12 01302 C	
680220	0539516	3941	N	2488	E	365	933	45	98	34538	23920	12845	04770	14804	11 00901 C	
680220	0941099	3935	N	2495	E	365	933	47	116	34538	23920	12845	04770	14804	11 01804 C	
680222	048747	3939	N	2502	E	365	19	47	78						16	
680227	1337484	3961	N	2551	E	365	35	47	67						10	
680310	0648171	3910	N	2436	E	365	33	45	72						11	
680310	0710590	3913	N	2423	E	365	9	50	167	12000	3060	21030	26021	16021	24 2805 C	
680314	1811098	3938	N	2494	E	365	43	45	86						12	
680323	1725990	3976	N	2548	E	365	33	46	127	15520	03256	25526	20334	29605	13 01402 C	
681028	125430	3889	N	2582	E	365	9	4	67	19206	26071	06018	10717	01408	14 01102 C	
690421	203640	3942	N	2509	E	365	9	1	83	35534	24131	12040	14804	05358	00 01303 C	
430620	153250	408	N	304	E	366	915	65	91	35308	23673	8513	13005	3816	04 2101 B	
430620	153250	408	N	304	E	366	915	65	91	7000	16000	90	25045	7045	22 2200 B	
530318	190613	400	N	273	E	366	9	73	297	33006	8677	23912	28513	19304	14 5509 A	
560116	070712	379	N	271	E	366	9	68	266	19026	7936	30743	24053	34209	11 8820 A	
560106	121541	404	N	263	E	366	9	55	110	10520	1500	28564	10571	28919	11 2003 B	
560220	203137	399	N	304	E	366	920	60	148	14516*	5590	32574	14561	32529	12 5711 B	
560220	203137	399	N	304	E	366	920	60	148	14613	26944	6343	12540	1819	12 5711 B	
570526	063334	4067	N	3086	E	366	9	71	320	25803	15774	34915	30213	3408	13 8909 A	
630311	072721	3799	N	2912	E	366	31	56	167	28304	1850	19040	14024	24430	03 04008 A	
630918	169808	4080	N	2913	E	366	921	64	210	30408*	3400	12482	12437	30453	02 05016 B	
630918	169808	4080	N	2913	E	366	21	64	210	19230	36332	6943	14057	3887	11 04818 B	
640110	1745970*	3741	N	2989	E	366	59	56	53	123	6510	15580	24580	6555	24515	12 02607 B
640110	1745970*	3741	N	2989	E	366	59	56	53	123	17000	26065	8025	3217	12817	23 02508 C
641006	1429579	4024	N	2816	E	366	923	52	151	3036	27233	15337	9057	18201	11 03309 B	
650302	2200072	3847	N	2833	E	366	942	50	68	210	19736	29004	2554	17980	2109	11 7425 B
650613	2001508*	3785	N	2932	E	366	33	51	59	165	2000*11000	90	2045	20045	22 06111 B	
650613	2001508*	3785	N	2932	E	366	933	51	59	165	1010*10000	19080	1055	19035	12 06111 B	
650823	1408986	4051	N	2617	E	366	33	51	55	170	16800	28815	7875	15443	243 22 02807 B	

*** BALKAN PROJECT *** CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ***** KNV1731210 = S2 ==
 PART 3 : REGIONAL LISTS OF QUALITY A/B AND QUALITY C/D SOLUTIONS IN CHRONOLOGICAL ORDER

1	5	10	15	20	25	30	35	40	45	50	55	60	65	70
601201	040237	3837	N	3047	E	366	70							
630924	021041	4085	N	2888	E	366	10	47	53					0800 D
650326	2029226*	3682	N	3094	E	366	111	50	86					16
650326	2029226*	3682	N	3094	E	366	111	50	67	26534	17007	7055	29678	7910 11 02402 C
650617	0258250	3777	N	2936	E	366	937	47	67	15500	24545	6545	1030	12030 22 02303 C
660122	0023443	3765	N	2995	E	366	32	48	84	25310	15271	34616	3004	29819 04 01301 C
660522	073729	3870	N	2792	E	366	23	51	85	26832	2132	14542	11406	21358 00 01102 C
660605	0914068	3907	N	2934	E	366	36	44	57					6
660619	175530	3855	N	2735	E	366	919	47	52					10
670719	0906222	3810	N	2887	E	366	41	48	82	4525	28745	15435	19106*	9545 00 01301 C
670722	1748065	4066	N	3062	E	366	26	50	105	2000	29056	11034	16023	6023 24 01786 C
670722	1809554	4072	N	3051	E	366	35	50	106	10010	21567	620	5522	322 7 14 01802 C
670722	203540	4079	N	3042	E	366	4	47	97	16530	5630	29045	21659	32109 11 01102 C
670722	2341598	4064	N	3053	E	366	930	47	67					15
670723	0403396	4061	N	3035	E	366	21	45	98	3030	27339	14537	8451	17905 11 01301 C
670726	091606	4061	N	3067	E	366	21	44	59					12
670814	200925	4074	N	3037	E	366	925	46	69					14
690305	1441164	4006	N	2756	E	366	33	47	68	14000	5000	90	14045	32045 22 1301 C
690324	1134340	3917	N	2870	E	366	37	46	92					22
690325	152112	3906	N	2841	E	366	928	49	72					14
690325	1613304	3908	N	2844	E	366	942	47	104	19412	10400	1478	19457	1433 12 1804 C
690328	1002174	3913	N	2845	E	366	937	49	65	15038	4321	29045	31104	21169 00 1402 C
700328	2159109	3928	N	2946	E	366	917	48	124	22404	33378	13312	08705	17911 03 02106 C
700328	2344001	3907	N	2976	E	366	932	50	71	07514	18352	33535	29114	03136 03 01200 C
700329	1437196	3874	N	2783	E	366	56	45	142					11 1508 C
700330	0646249	3909	N	2903	E	366	923	45	94					15
700330	0649050	3943	N	2940	E	366	933	46	57	20218*	11200	02280	20255	02235 12 00801 C
700330	1632355	3909	N	2959	E	366	30	47	73	21128*	12100	03170	21165	03125 11 01405 C
700330	203805	3905	N	2962	E	366	928	45	127					24
700331	0346511	3903	N	2979	E	366	935	47	54	03028	12000	21070	03065	21025 11 00801 C
700331	1187599	3889	N	2973	E	366	41	46	127	01520	18500	19570	01565	19525 12*02306 C
700409	1012304	3911	N	2941	E	366	934	47	54					17
700415	162958	3934	N	2930	E	366	928	46	121	2030	11000	20060	2075	20015 11 1202 C
700416	1143223	3898	N	2995	E	366	943	48	94	29010	3860	19528	15013	24628 03 1500 C
700483	0718138	3894	N	3001	E	366	932	49	86	5080	38228	17847	9960	20710 11 00701 C
700487	0154126	3894	N	2981	E	366	937	44	129	19520	10500	1570	19565	1925 12 1906 C
700487	222443	3906	N	2954	E	366	911	47	86	16012	28066	6620	11423	2205 14 1500 C
700480	235909	3909	N	2959	E	366	929	45	112	16500	7580	90	16545	34545 22 1703 C
700508	0249146	3893	N	2998	E	366	20	46	80	2030	11080	20060	2075	20015 11 1707 C
710215	0819561	3917	N	2940	E	366	928	49	109					20
									71	26510	08543	16545	11722	22639*02 01102 C

*** BALKAN PROJECT *** CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ***** KNM1731210 = S2 ==
 PART 3 : REGIONAL LISTS OF QUALITY A/B AND QUALITY C/D SOLUTIONS IN CHRONOLOGICAL ORDER

1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	
710512	2013081	3749	N	2988	E	366	936	48	63	21227	33647	10530	15943	06802 14 01503 C	
710513	0445274	3746	N	2974	E	366	914	48	52	11310	34474	20512	24902	15916 04 02101 C	
710514	2218230	3767	N	3000	E	366	933	45	36	15030	26840	03536	09580	00104 11 00701 C	
710516	0929014	3797	N	2974	E	366	933	49	44	14528	05580	32562	14573	32517 11 00901 C	
710517	1416179	3767	N	2988	E	366	933	48	59	00500	27565	09525	04718	14318 23 01201 C	
710520	0306452	3758	N	2998	E	366	933	48	47	18335	09380	00355	00310	18380 00 01002 C	
710608	1659248	3792	N	2977	E	366	910	47	35	00500	90	09500	05000	14000 23 00801 C	
710610	0931344	3911	N	2960	E	366	9	49	33					8	
710615	2255455	3705	N	2896	E	366	933	46	37	26010	14567	35420	03907	30522 04 00900 C	
710628	2337399	3755	N	2982	E	366	9	49	58	09000	18070	02000	04714	31314*24 01001 C	
710629	0426311	3746	N	2989	E	366	928	49	56	13025	24138	01542	08250	33910 12 00802 C	
710921	1648516	3727	N	3016	E	366	37	48	55	29042	01009	11558	25173	10215 11 01301 C	
710928	0510248	3712	N	3011	E	366	36	47	40					9	
711106	1943468	3902	N	2973	E	366	914	50	53	10530*	21935	34640	05254	31306 14 01101 C	
720314	1405458	3928	N	2942	E	366	33	54	106					36	
480911	085232	372	N	232	E	368	80	65	88	10020	515	24065	26824	12442 02 1704 B	
480911	085232	372	N	232	E	368	80	65	88	7910	34125	18563	23532	10248 02 1704 B	
541223	162718	379	N	211	E	368	9	5	55	77	2530	12516	24055	21914	34768 00 1401 B
570529	183910	3714	N	2374	E	368	9	0	53	87	11500	2580	20510	15907	25107 23 1902 B
580503	201820	3615	N	2174	E	368	27	55	120	2700	11700	90	20745	2745 22 1602 B	
580503	201820	3615	N	2174	E	368	927	57	55	120	4510	13500	22580	22535	4555 02 1602 B
611211	169310	3640	N	2337	E	368	69	48	91	1530	10500	19560	19515	1575 00* 1705 B	
620828	105956	3782	N	2289	E	368	95	67	274	2040	27022	15842	17901	8768 00 11615 A	
650405	0312546*	3770	N	2180	E	368	34	57	218	3516	28254	13632	17810	8235 13 9 45	
660524	1109254	3737	N	2200	E	368	34	54	62	218	17224	25304	34166	15368	34521 11 79
660611	1205027	3737	N	2202	E	368	43	48	99	20518*	11500	2572	20563	2527 12 01500 B	
660901	1422569*	3746	N	2108	E	368	47	48	91	7806	16806	30081	26338	7151 02 01904 B	
660901	1422569*	3746	N	2212	E	368	915	53	198	9902	653	19037	24024	13827 04 04815 B	
660901	1422569*	3746	N	2212	E	368	15	53	198	12701	3560	21730	26620	16821 14 65	
670514	0415599*	3770	N	2117	E	368	48	48	132	8024*	34218	21860	24911	11063 02 02906 B	
670514	0415599*	3770	N	2117	E	368	48	48	132	8024*	17512	29063	27020	5766 02 02906 B	
680704	2147556*	3776	N	2323	E	368	920	52	226	02821	27347	13435	07541	17409*13 05813 B	
680704	2147556*	3776	N	2323	E	368	20	52	226	01330	27021	15052	05966	17409*13 05813 B	
700124	1543540	3721	N	2345	E	368	105	47	42	01000	28010	10080	18044	02044 22 01100 B	
700211	1901189	3759	N	2267	E	368	79	49	125	09736	36220	20048	22007	11170 00 04100 A	
700423	0429482	3751	N	2273	E	368	74	48	133	12414	21401	31076	30531	12259 02 4210 A	
710811	0537287*	3696	N	2391	E	368	120	49	42	23037	33418	08448	6504	17172 00 2107 B	
710811	0537287*	3696	N	2391	E	368	120	49	42	01010	27812	14074*	18034	02454 02 02206 B	

=== BALKAN PROJECT === CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ===== KNM1731210 = S2 ==
PART 3 : REGIONAL LISTS OF QUALITY A/B AND QUALITY C/D SOLUTIONS IN CHRONOLOGICAL ORDER

1	5	10	15	20	25	30	35	40	45	50	55	60	65	70				
730422	1339461	3518	N	2339	E	370	56	45	31	7030	16000	25060	25015	7075	00	1100	C	
550912	060924	* 322	N	296	E	371	33	61	267	12624	35854	22825	26701	17736	04	8317	A	
550912	060924	* 3220	N	296	E	371	33	61	267	12435	535	24536	27401	18356	00	8317	B	
640116	1852011	3319	N	2609	E	371	33	47	103	35012	8625	23662	32052	19028	11	02906	B	
660214	1757501*	3496	N	2711	E	371	43	48	115	32041	21615	11045	12502	2674	00*	03008	B	
660214	1757501*	3496	N	2711	E	371	43	48	115	29040	8000	11050	11005	29085	00*	02909	B	
400816	160223	357	N	308	E	371	940	55	42	24040	15000	6050	6005	24085	00	700	C	
400816	182312	357	N	308	E	371	925	52	39	24040	18000	6050	6005	24085	00	1000	C	
450902	115405	344	N	289	E	371	80	64	76	13045	4000	31045	13000	90	00	800	C	
460716	052626	338	N	253	E	371	915	57	82	5510	14500	23580	23535	5555	02	1000	C	
580403	071833	3487	N	2745	E	371	910	50	104	21818	12800	3872	21863	3827	12	2404	C	
621026	112607	3355	N	2762	E	371	100	52	108	15037	6000	33053	15082	33088	11	2209	C	
631112	070632	3538	N	2964	E	371	73	50	106							18		
640825	1111920	3575	N	2884	E	371	51	48	55	125	8020	33044	18840	12644	22912	11	2102	C
640827	1931597	3556	N	2884	E	371	38	48	54	113	14500	5500	90	14545	32545*	22	01600	C
640918	0008476	3569	N	2907	E	371	40	47	52	95	4500	18530	31560	25258	1838	23	1100	C
660114	183931	3472	N	2700	E	371	22	45	54							13		
661029	1213068	3474	N	2754	E	371	64	46	42							9		
670980	2353316	3417	N	2667	E	371	35	45	59							16		
680819	1535922	3374	N	2568	E	371	33	49	54							12		
560815	120255	4322	N	1599	E	382	9	0	55	128	22007	12054	31535*	25230	0318	13	2984	B
341130	025819	441	N	140	E	382	930	56	54	12008	21070	3020	34317	7714	23	2409	C	
620417	100342	4212	N	1720	E	382	10	55	127	5510	14817	29570	25034	3652	02	2507	C	
670604	145432	4281	N	1762	E	382	22	46	64							11		
671209	0809560	4200	N	1641	E	382	66	46	83							11		
720206	0134224	4401	N	1319	E	382	9	49	30							11		
																	8	
610622	005605	4244	N	1935	E	383	43	50	115	5425	14400	23465	23420	5470	00*	1403	B	
620107	100315	4327	N	1696	E	383	913	59	177	10514	34464	20021	24405	15126	04	3904	B	
620111	050505	* 4331	N	1694	E	383	931	61	212	10013	34264	19622	23907	14626	04	05406	A	
620111	050505	* 4331	N	1694	E	383	31	61	212	28508	1714	16674	26951	11736	12	05109	B	
620121	025135	4315	N	1702	E	383	925	52	96	12070	34964	21618	25801	17026	04	03002	B	
620611	071537	4365	N	1831	E	383	9	0	60	202	16530	4641	27935	22049	31303	11	04913	B

=== BALKAN PROJECT === CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ===== KNM1731210 = S2 ==
PART 3 : REGIONAL LISTS OF QUALITY A/B AND QUALITY C/D SOLUTIONS IN CHRONOLOGICAL ORDER

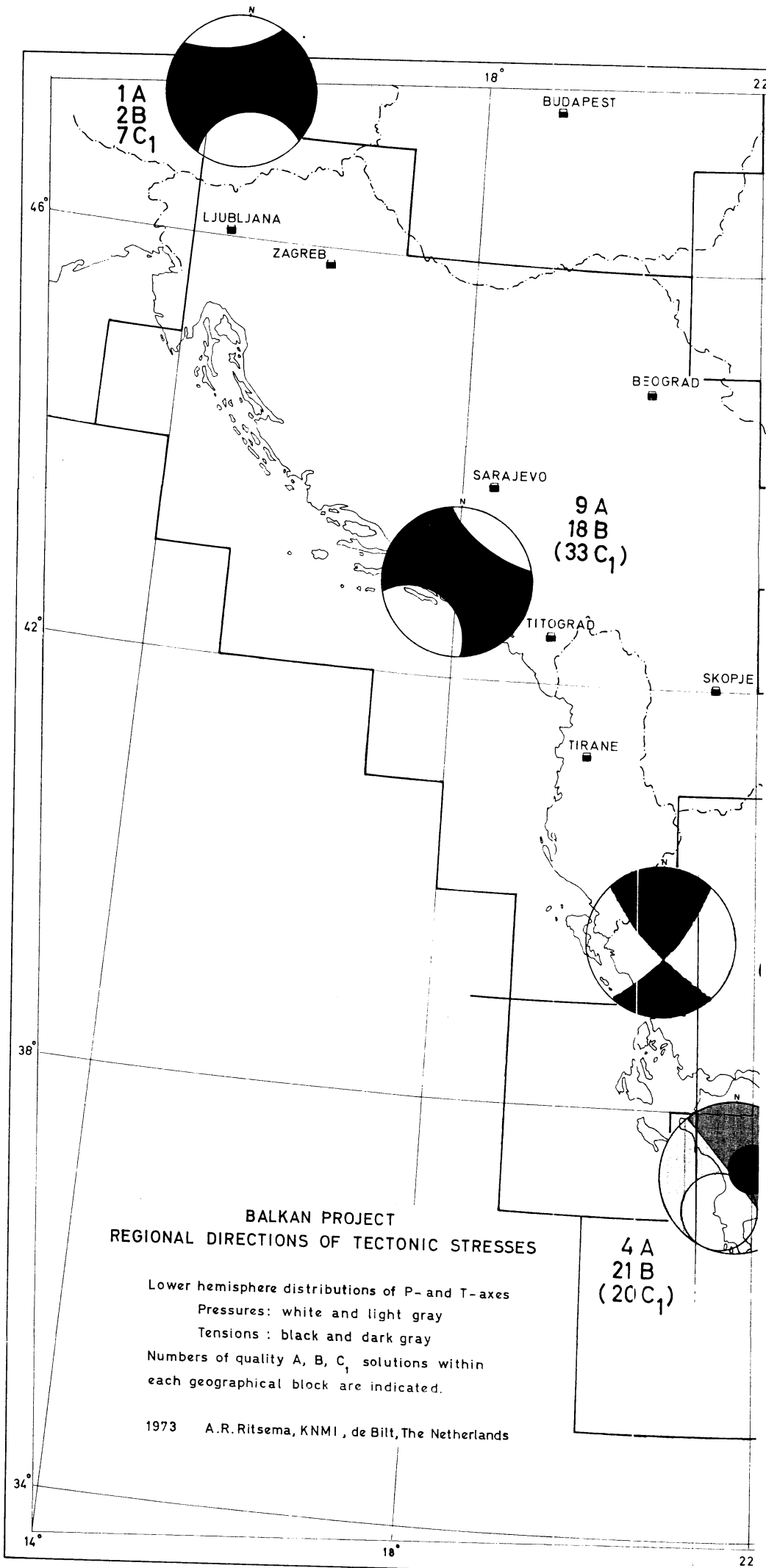
1	5	10	15	20	25	30	35	40	45	50	55	60	65	70				
630519	100008	* 4627	N	1453	E	383	53	47	118	21530	12206	2260	3015	23274	00	02404	B	
630519	100008	* 4627	N	1453	E	383	953	47	118	20024	8840	31240	34910	24848	00	02305	B	
630726	041712	* 4204	N	2138	E	383	910	61	222	20812	8768	30218	25422	34604*	13	05714	B	
630726	041712	* 4204	N	2138	E	383	910	61	222	18429	7628	31147	23460	34210*	11	05714	B	
640413	0829599	4527	N	1804	E	383	9	55	158	25035	15310	5053	6209	29076	00	04108	A	
660805	1747484*	4216	N	1876	E	383	935	50	61	5310	14380	23380	23335*	5350	02	01502	B	
660805	1747484*	4216	N	1876	E	383	935	50	61	20818	9451	31033	25537*	33209	13	01502	C	
660805	1747484*	4216	N	1876	E	383	935	50	61	19210	9148	29040	23239*	33720	13	01403	C	
661208	1131206	4217	N	1887	E	383	47	51	132	3530	38304	20560	21115	5075	00	02510	C	
681103	0449337	4210	N	1935	E	383	928	51	214	33015	89766	23518	19102	28294	03	02605	B	
691026	1536924	4484	N	1730	E	383	33	51	56	212	00020	89717	22563	19423	33360	02	04606	A
691027	0810582	4485	N	1722	E	383	33	53	61	265	34725	09837	23242	19610	29851	00	06007	A
691231	1318333	4488	N	1723	E	383	933	48	115	07020*	17536	31747	02850	27716	11	02005	B	
700907	2058497	4395	N	1606	E	383	9	55	83	19510	09544	29545	23439	34322	12	04112	B	
380327	111624	462	N	168	E	383	9	7	56	69	22010	13000	4080	4035	22055	02	700	C
430120	123819	432	N	164	E	383	927	53	29							6		
630214	131857	4433	N	1512	E	383	950	31	85	14520	8850	24832	19339	28988	13	01701	C	
630423	140258	4203	N	1960	E	383	54	46	71							12		
640316	1643206	4554	N	1435	E	383	20	47	45							7		
641013	1842	421	N	215	E	383	4			33510	7540	23050	29540	18020	12	5	D	
641022	2330	421	N	215	E	383	10			15035	4520	29050	20070	31505	11	5	D	
641024	2509	421	N	215	E	383	5			19505	18515	30875	040	21050	02	5	D	
650304	0531	421	N	215	E	383	3			23010	33050	13040	8520	19035	03	5	D	
660806	023103	4218	N	1879	E	383	9	3	52	141	5525	14500	23565	5970	23520	11	02715	C
660806	0592018	4230	N	1895	E	383	48	48	79							16		
660820	1205193	4218	N	1865	E	383	933	54	76	35515	12267	26018	30824	21702	14	01406	C	
660820	1908218	4210	N	1879	E	383	42	47	78	24530	33602	7060	6715	23876	00	01100	C	
660828	041811	4215	N	1875	E	383	922	46	77	7040	16000	25050	25005	7085	00	01002	C	
678703	025343	4402	N	1918	E	383	9	1	70							15		
671221	000940	4216	N	2062	E	383	926	46	71	24522	35642	13540	19846	9611	11	1302	C	
681203	2057310	4451	N	1845	E	383	9	5	80							13		
690809	1625859	4233	N	1922	E	383	930	45	181	4508	31560	13930	18421	9621	24	1403	C	
691027	025534	4498	N	1704	E	383	918	45	83	19540	10500	01550	01505	19585	00	01302	C	
691027	0853427	4491	N	1699	E	383	9	48	68							23		
700825	0140095	4329	N	1841	E	383	910	52	40	19200	24285	06205	01704	10794	23	00803	C	
591005	203404	4089	N	1985	E	391	910	55	112	35520	8500	17570	35565	17525	12	1802	B	
591007	083040	4093	N	1987	E	391	9	0	52	178	5010	31042	19146	19822	8840	02	4910	A

=== BALKAN PROJECT === CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ===== KNV1731210 = S2 ==
 PART 3 : REGIONAL LISTS OF QUALITY A/B AND QUALITY C/D SOLUTIONS IN CHRONOLOGICAL ORDER

1	5	10	15	20	25	30	35	40	45	50	55	60	65	70				
650529	0414561	3519	N	2257	E	400	43	47	69	24813	362	15224	10808	20227	03	1600	B	
660604	0616575*	3663	N	2097	E	400	82	48	125	31027	21019	9056	11515*	35065	00	04104	B	
660604	0616575*	3663	N	2097	E	400	82	48	125	33508	21568	5820	10309*	1020	04	03906	B	
660712	025622	3590	N	2249	E	400	9	7	144	7208	31374	16414	20904	11716	04	03608	B	
660712	025622	3590	N	2249	E	400	9	7	144	28508	1300	10582	28553	10537	12	03212	C	
730105	0549175	3581	N	2183	E	400	33	53	51	109	4030	38510	20058	21315	6775	00*	3805	B
730126	0750128	3582	N	2210	E	400	58	47	60	6030	15000	24060	24015	6075	00	1303	B	
360613	003237	327	N	225	E	400	9		50	54							6	
510831	122937	355	N	228	E	400	915		55	107							9	
550128	074159	339	N	236	E	400	9		52	43	1010	10000	19080	19035	1055	02	900	C
580605	132946	3699	N	2066	E	400	916		58	89							8	
600201	115939	3528	N	2299	E	400	910		55	116	21507*	12500	3583	21552	3538	12	1808	C
601229	181941	3494	N	2252	E	400	58	50	67								9	
610128	071816	303	N	220	E	400	89	47			5506	32230	15560	8442	21033	12	1500	
620110	123633	3583	N	2253	E	400	87	44	55	53							12	
630131	150704	3592	N	2186	E	400	62	49	78	4030	28240	15536	9550	18904	11*	01302	D	
630221	171431	3269	N	2097	E	400	10		56	174	5512	31248	15540	20118	9737	04	3907	C
630221	202639	3266	N	2110	E	400	0			88							10	
670815	0435529	3654	N	1928	E	400	33	46	51								12	
680109	2315428	3552	N	2254	E	400	46	47	69	24515	461	14824	19928	10506	14	1403	C	
730116	2245166	3514	N	2256	E	400	28	45	58	3010	12000	21080	21035	3055	02	1001	C	
730312	2030438	3591	N	2178	E	400	44	47	55	5700	14720	32770	25542	3942	22	900	C	
340608	031709	463	N	125	E	545	920		45	34	2500	90	11500	16000	7000	24	1500	B
361018	031012	461	N	123	E	545	910		56	64	2400	29452	11438	16626	6226	24	3400	A
361019	070554	460	N	125	E	545	910		45	23	2400	90	11400	15900	6900	24	1103	C
720416	1810035*	4773	N	1612	E	546	918	49	43	11588	02570	20520	15814	25214*	23	01401	B	
720416	1810035*	4773	N	1612	E	546	918	49	45	07020	16616	29064	04562	26222*	11	01401	B	
280327	083228	464	N	130	E	546	920		58	73	16555	26007	00054	35108	13178	00	1100	C
541011	164525	463	N	131	E	546	910		43								7	
581105		4650	N	1308	E	546	9	2	48								D	
631202	064905	4803	N	1620	E	546	9	0		1000	90	10000	14500	5500	24	1100	C	
640630	1229590	4773	N	1592	E	546	9	3	47	82	27020	080	9070	9025	27065	02	01403	C
641027	1946091	4785	N	1595	E	546	9	1	54	48	208	90	9200	4700	13700	23	01303	C
									88	14525	5448	25340	19636	30120	13	02903	C	

=== BALKAN PROJECT === CATALOGUE OF EARTHQUAKE MECHANISM SOLUTIONS ===== KNV1731210 = S2 ==
 PART 3 : REGIONAL LISTS OF QUALITY A/B AND QUALITY C/D SOLUTIONS IN CHRONOLOGICAL ORDER

1	5	10	15	20	25	30	35	40	45	50	55	60	65	70				
720416	1104442	4773	N	1602	E	546	919	44	49	14512	28862	05025	00508	10027	03	00900	C	
560112	054609	475	N	193	E	549	9	0	57	113	12040	23324	34540	14300	5366	00	1404	C



**BALKAN PROJECT
REGIONAL DIRECTIONS OF TECTONIC STRESSES**

Lower hemisphere distributions of P- and T-axes
 Pressures: white and light gray
 Tensions : black and dark gray
 Numbers of quality A, B, C₁ solutions within
 each geographical block are indicated.

1973 A.R. Ritsema, KNMI, de Bilt, The Netherlands

