GSA Data Repository Item # 8527

Title of article Florence-Niagara terrane: An early Proterozoic accretionary complex, Lake Superior region, U.S.A.

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see Bulletin v. 96, p. 1179 - 1187

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Table and Figures

REPOSITORY APPENDIX

FIGURE CAPTIONS

1. Structural data plotted on lower hemisphere on Schmidt net. Circles - fold axes, bxcl intersections; dots - poles to bedding; triangles - elongation and alignment lineations; squares - poles to axial planes of minor folds and cleavage. Hollow symbols represent first phase or dominant lineations; infilled symbols represent younger or sub-dominant lineations (see text). Lined circles in Packet 7 shows bedding/cross-bedding intersection lineation.

2. Plot of bed thickness ratio, relative to hinge thickness, against dip of bedding. A. Packet 1 folds (n = 12). B. Packet 2 folds (n = 29).

3. Apical angle plotted as a function of rake of fold axis in axial plane. Packet 8.

4. Metamorphism of western Florence-Niagara terrane. Redrawn from Dutton (1970).

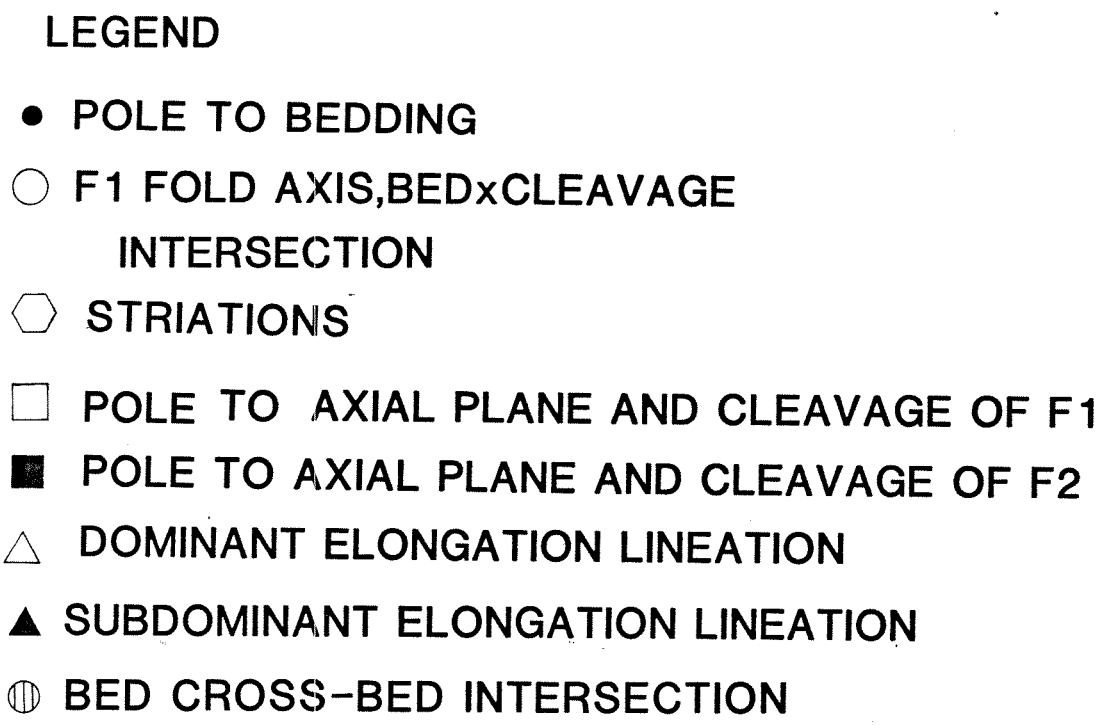
TABLE 1. Summary of Fault Packages

Packet	Definition of Boundaries	Lithology	General Structure	Orientation strain axes	Deformation History
1	N contact: truncate stratigraphy; S contact: local truncations of stratigraphy, change in structural style.	dolomite (Chocolay Group); quartzite, iron formation (Menominee Group); both shelf deposits.	S-facing homocline with some major folds; axial planes strike WNW, dip vertically, fold axes plunge shallowly.	XY plane strikes WNW, dips steeply. X either subhorizontal or subvertical.	SSW-shortening; superposed heterogenous strains cause two extension directions?
2	S contact: change in stratigraphy.	deep water (slope basinal) mudstones (now slates) and sandstones: Baraga Group.	mostly S-facing homocline with some major folds; axial planes strikeWNW dip vertically, fold axes girdled in mean axial plane.	XY plane strikes WNW dips steeply. X plunges steeply W.	SSW-shortening. Rotation of fold axes toward direction of extension (model of Sanderson, 1973) accompanying great strain.
3	S contact: abrupt change in sedimentologic facies and structure.	shallow water quartzites of Baraga Group.	SW-facing homocline. Fold axes and bedding cleavage lineations plunge down the WNW striking foliation.	XY plane strikes WNW, dips steeply. X plunges steeply W.	SSW-shortening; origin of reclined folds unclear; due to non-coaxial strain history?
4	S contact: abrupt change in tectonostratigraphy.	deep water mudstones (now slates) and sandstones: Baraga Group.	SW-facing homocline(?, top indicators rare). Folds uncommon, foliation strikes NW, dips steeply south. Cut by right lateral strike-slip faults that have associated folds in fault walls.	XY plane strikes NW, dips steeply SW. X plunges downdip. Axes of strain during strike-slip faulting: XY, WNW, subvertical, X, subhorizontal.	SW shortening followed by strike-slip faulting.

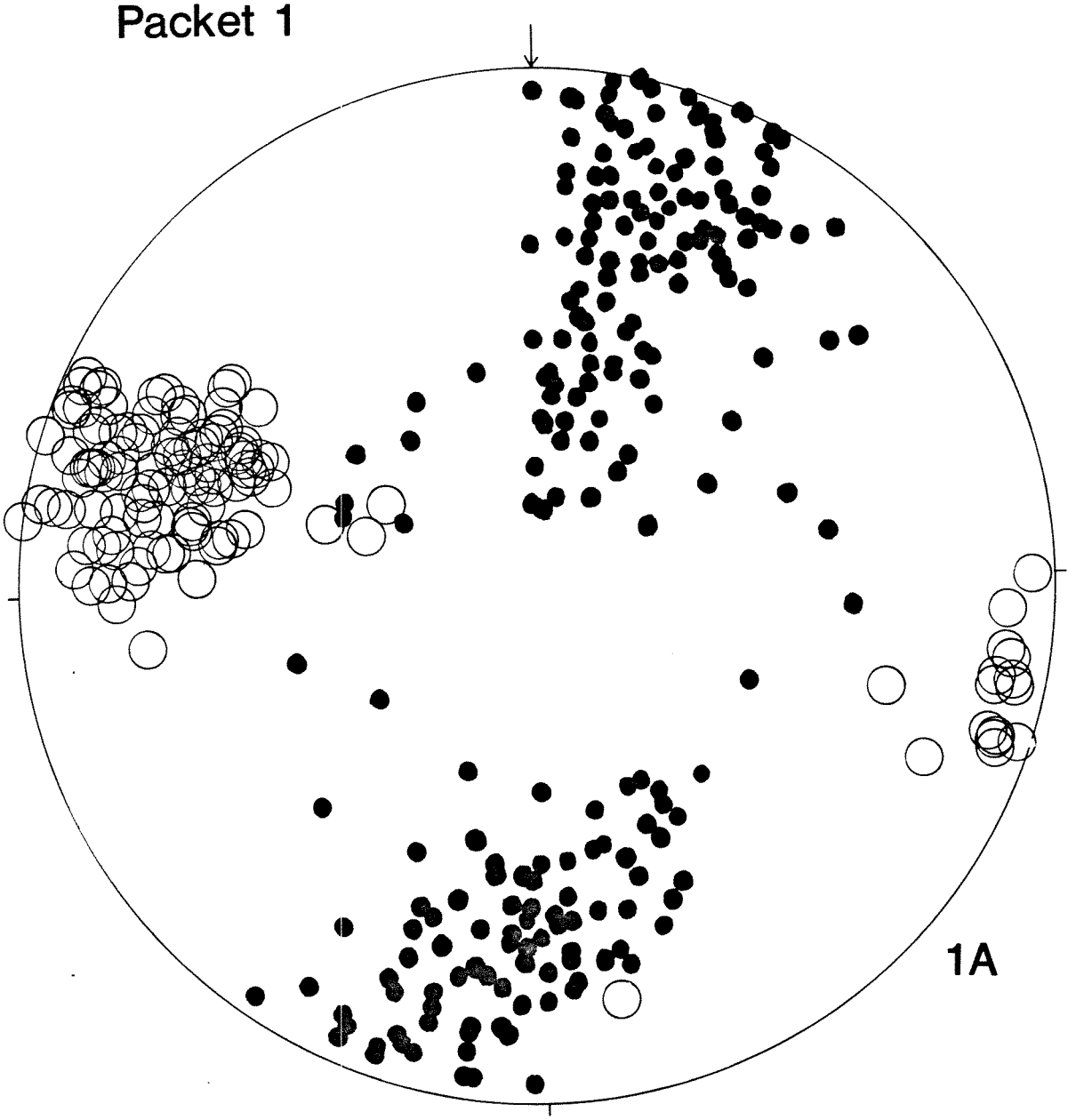
TABLE 1. (cont'd)

Packet	Definition of Boundaries	Lithology	General Structure	Orientation strain Axes	Deformation History
5	N contact: truncation stratigraphy; S contact, change in structural style.	dolomite (Chocolay Group); quartzite and iron formation (Menominee Group): shelf deposits.	S-facing homocline with a few major folds. Axial planes and foliations strike WNW, dip steeply. Fold axes plunge shallowly.	XY strike WNW, dips steeply.	SSW shortening.
6	S contact: change in stratigraphy.	poorly exposed deep-water facies (Baraga Group).	poorly exposed; foliation strikes WNW, dips steeply. Some fold axes reclined.	poorly constrained; XY strikes WNW, dips steeply.	poorly constrained SSW shortening.
7	N contact: poorly constrained; S contact: abrupt change in sedimentary facies.	shallow water quartzites (Baraga Group).	SW-facing homocline with local regional warps. Foliation strikes NW, fold axes plunge, down-dip.	XY strikes NW, X plunges steeply.	SSW shortening; origin of steeply plunging fold axes due to non-coaxial strain(?)
7A	Both contacts: based on pinch-out of unit.	shallow water quartzites (Baraga Group).	poorly understood; foliations strike WNW and dip steeply; bedding-cleavage intersections are girdled.	XY strikes WNW.	SSW shortening; deformation is poorly constrained; rotation of bedding cleavage intersections toward X with progressive strain (?).
8	Both contacts: truncation of stratigraphy.	shelfal to basinal volcanics (Baraga Group), iron formation and slate (Paint River Group).	poorly understood; major fold with SE closing hinge? Two phases of deformation: first, axial planes strike W, steep dips, girdled fold axes; second, N-S striking axial planes, steep dips.	first deformation: XY strikes W, dips steeply second deformation: XY strikes N, dips steeply.	first deformation S-shortening accompanied by great strain (?) such that fold axes girdled in mean axial plane; second deformation folds formed by W-shortening.

Figure 1.


LEGEND
POLE TO BEDDING
F1 FOLD AXIS,BEDxCLEAVAGE INTERSECTION
STRIATIONS
POLE TO AXIAL PLANE AND CLEAVAGE OF F1
POLE TO AXIAL PLANE AND CLEAVAGE OF F2
DOMINANT ELONGATION LINEATION
SUBDOMINANT ELONGATION LINEATION
BED CROSS-BED INTERSECTION

Packet 1



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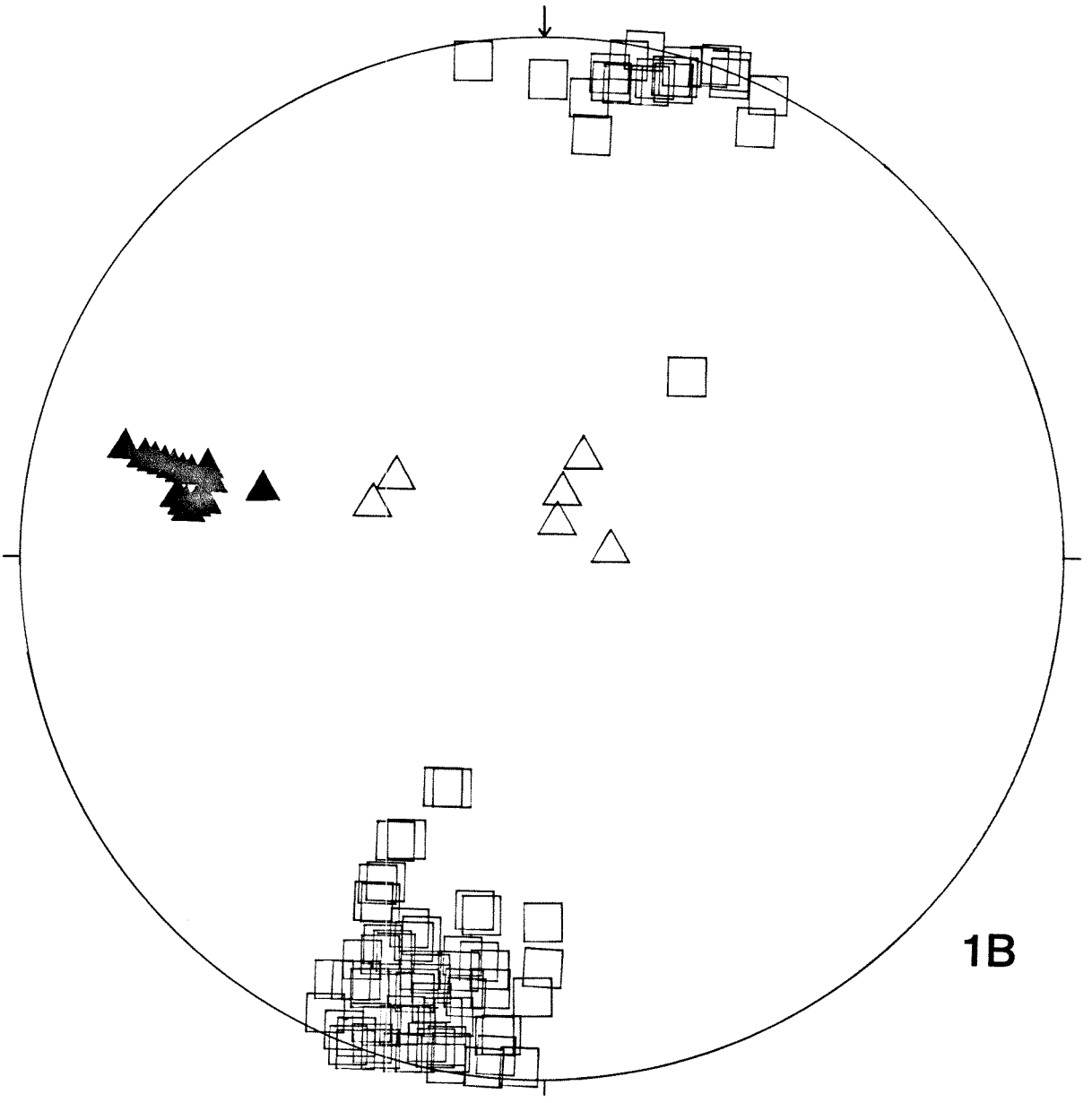

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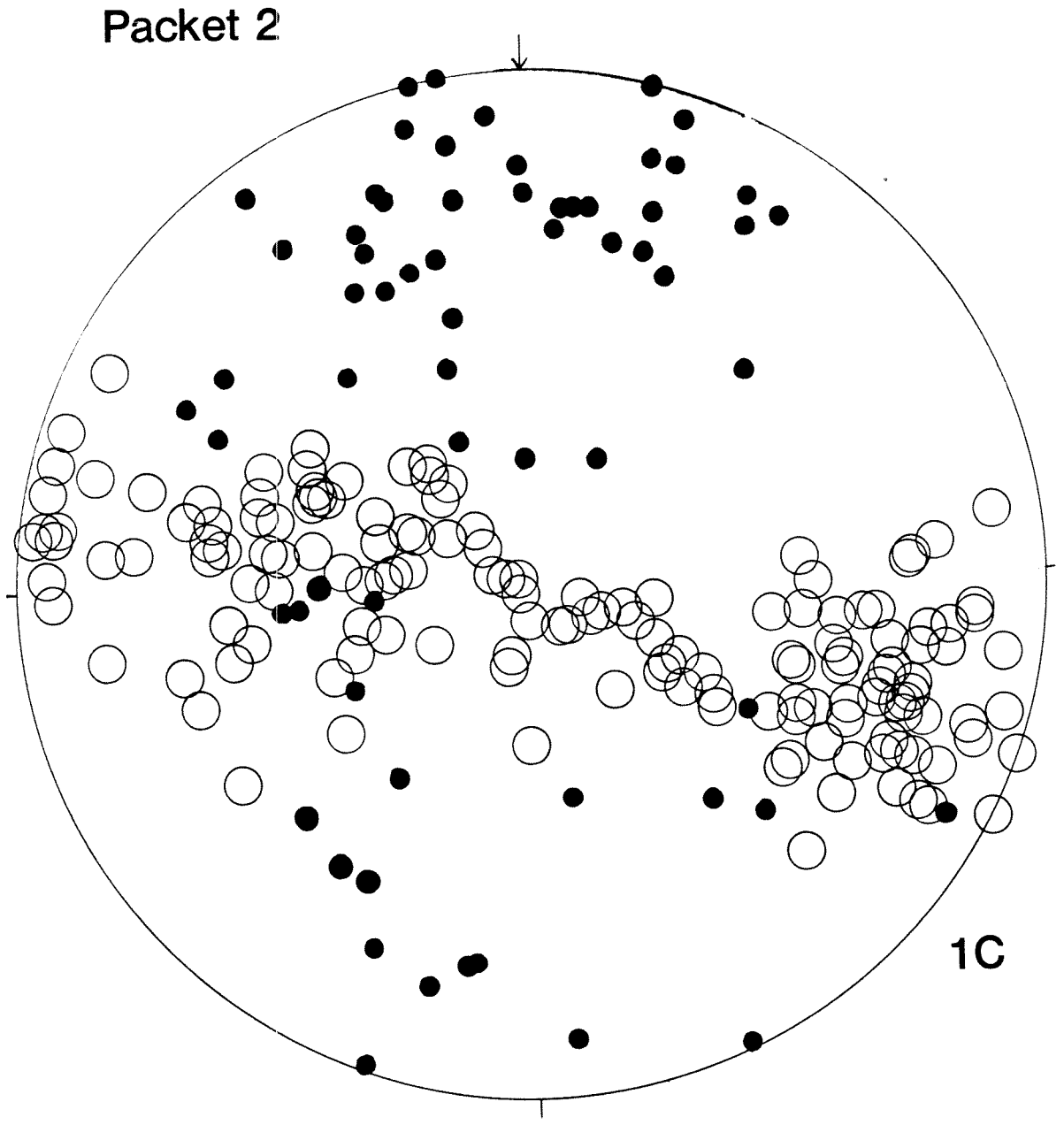
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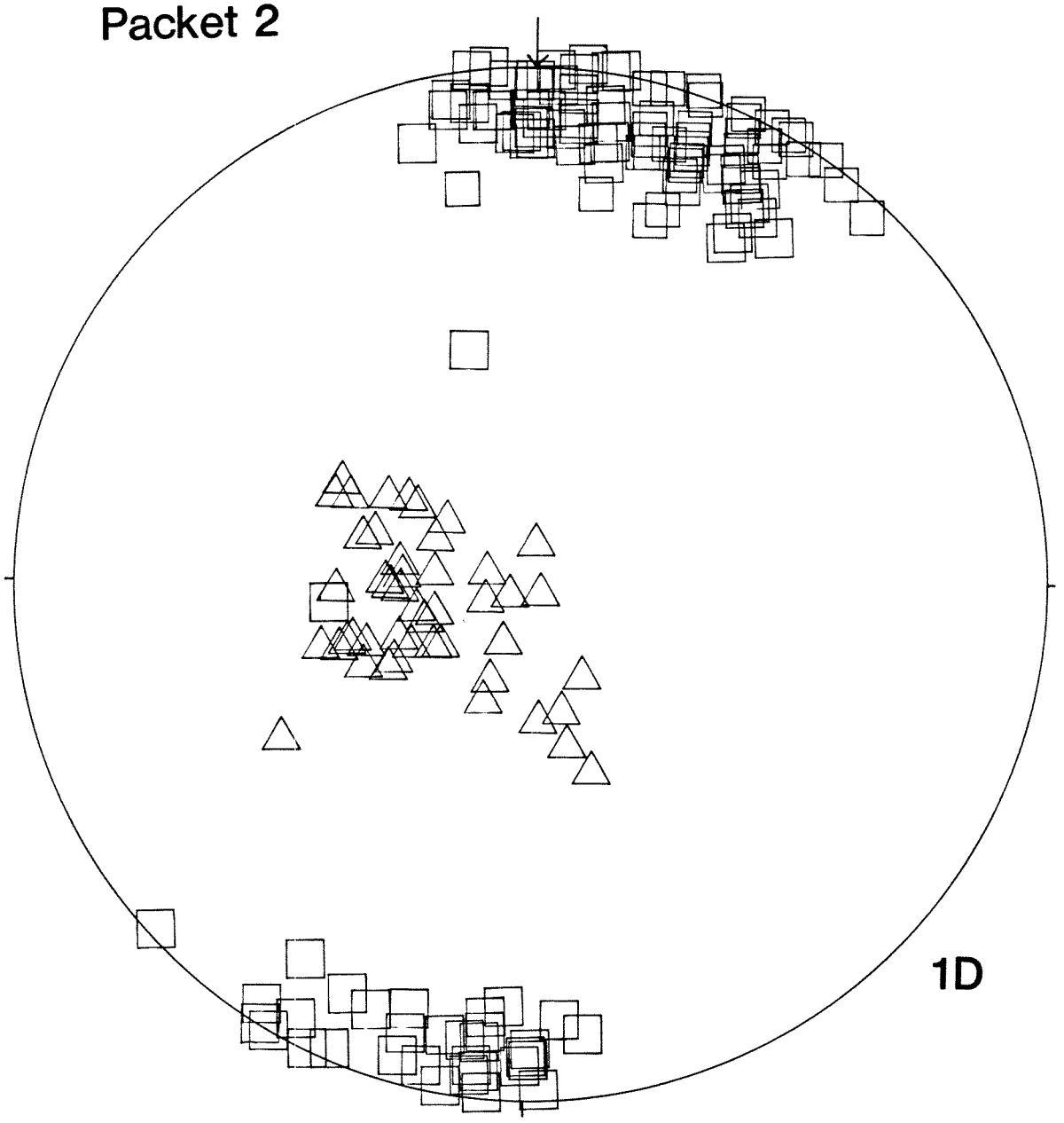
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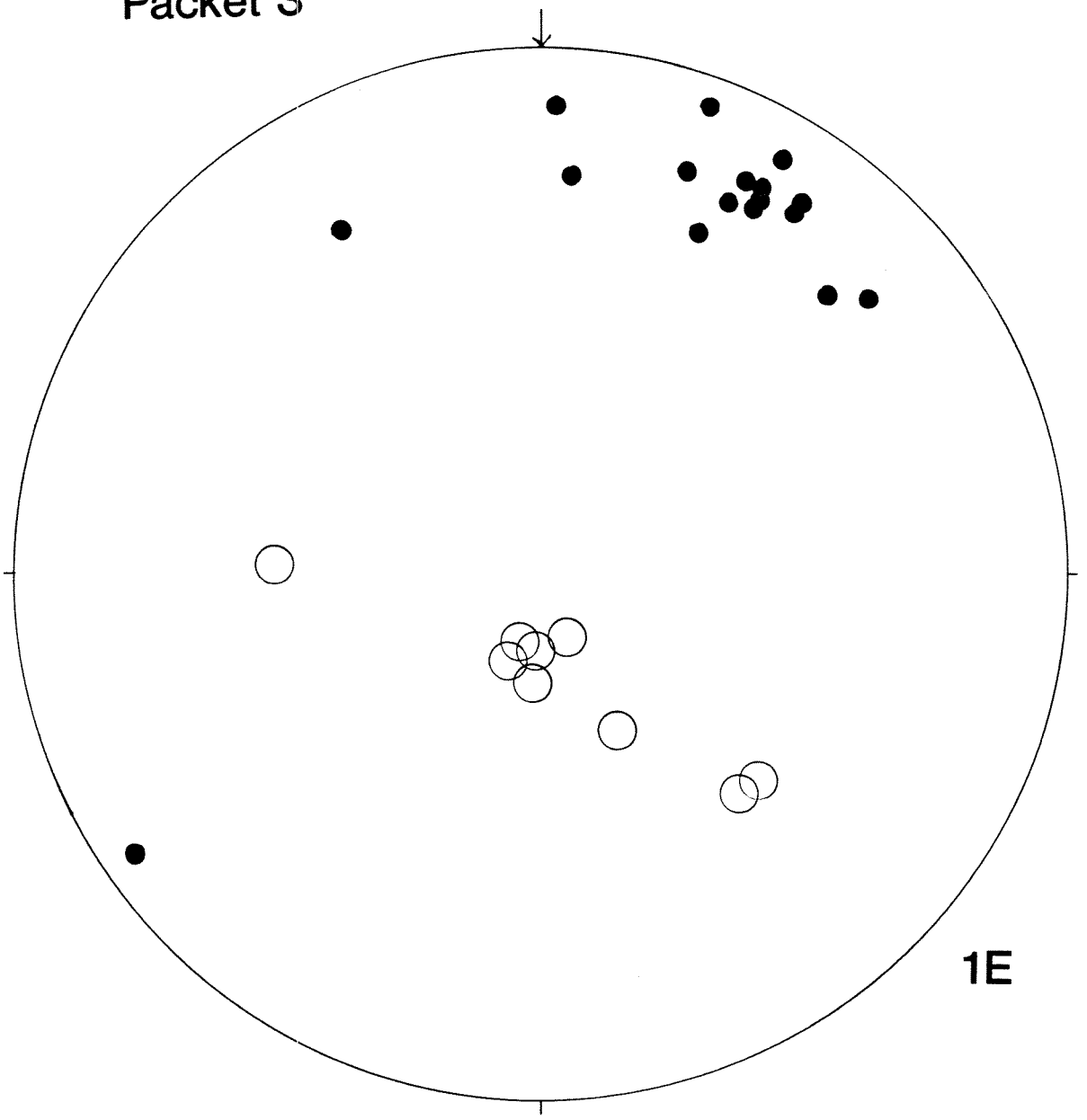

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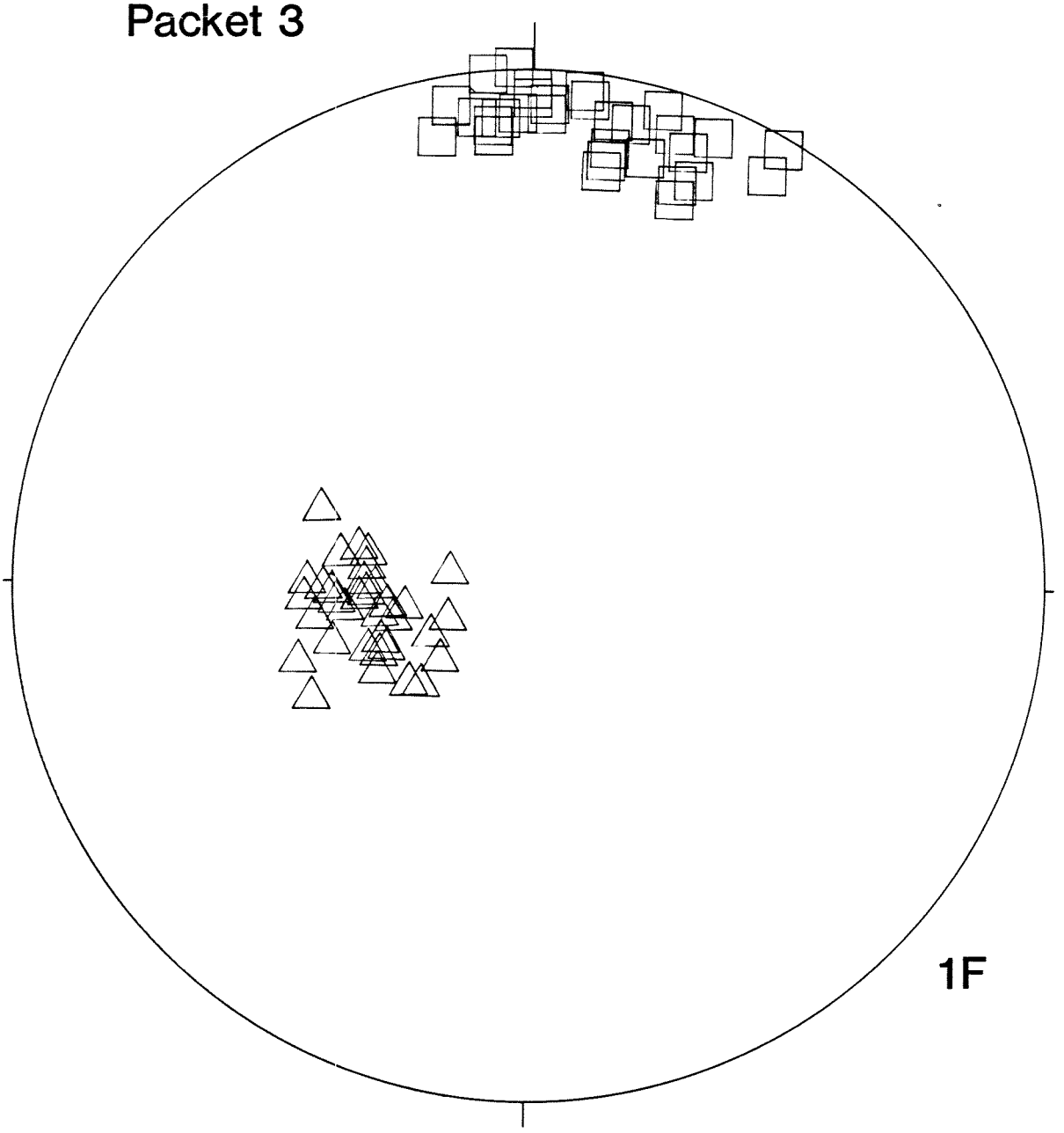

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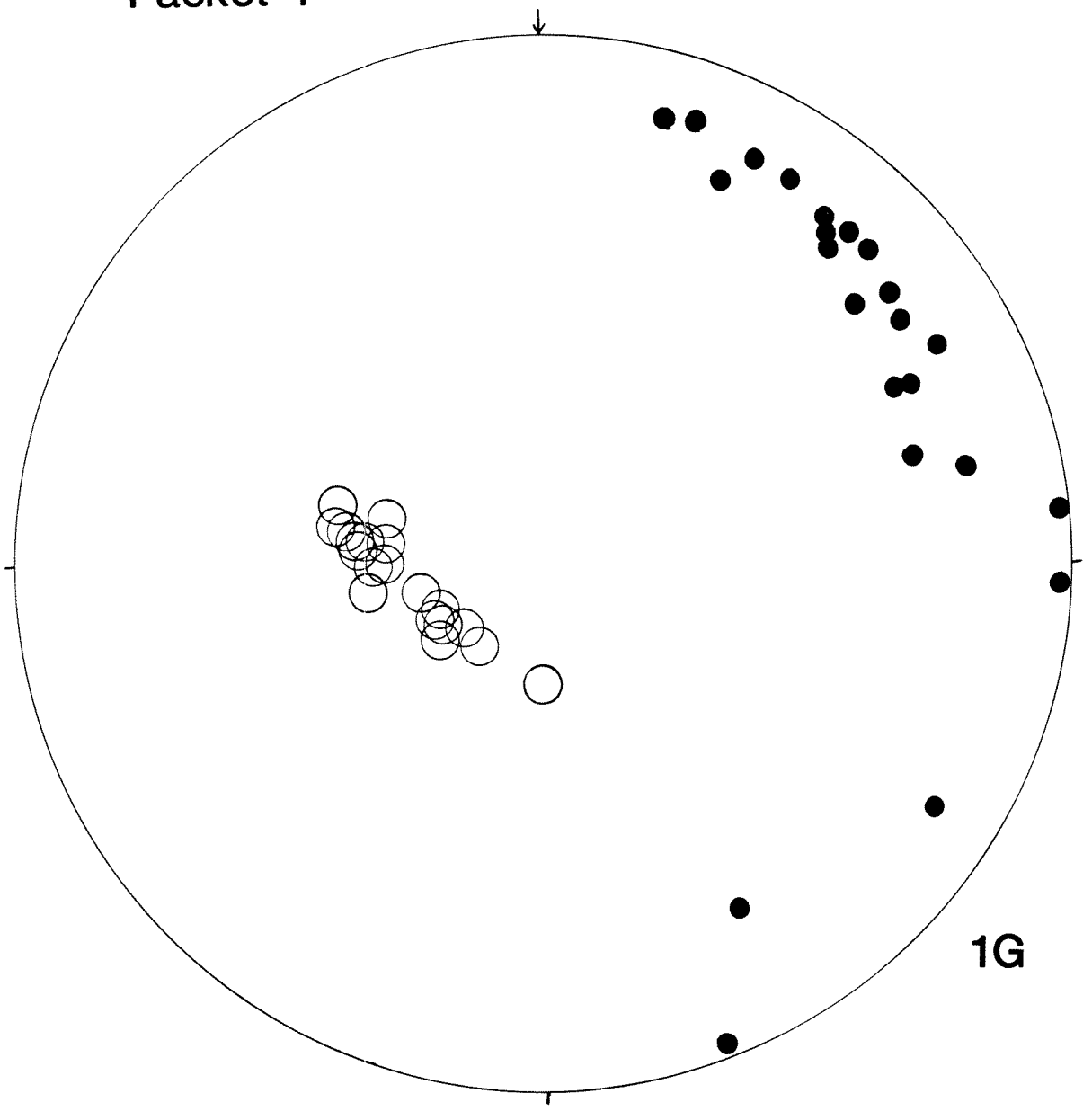

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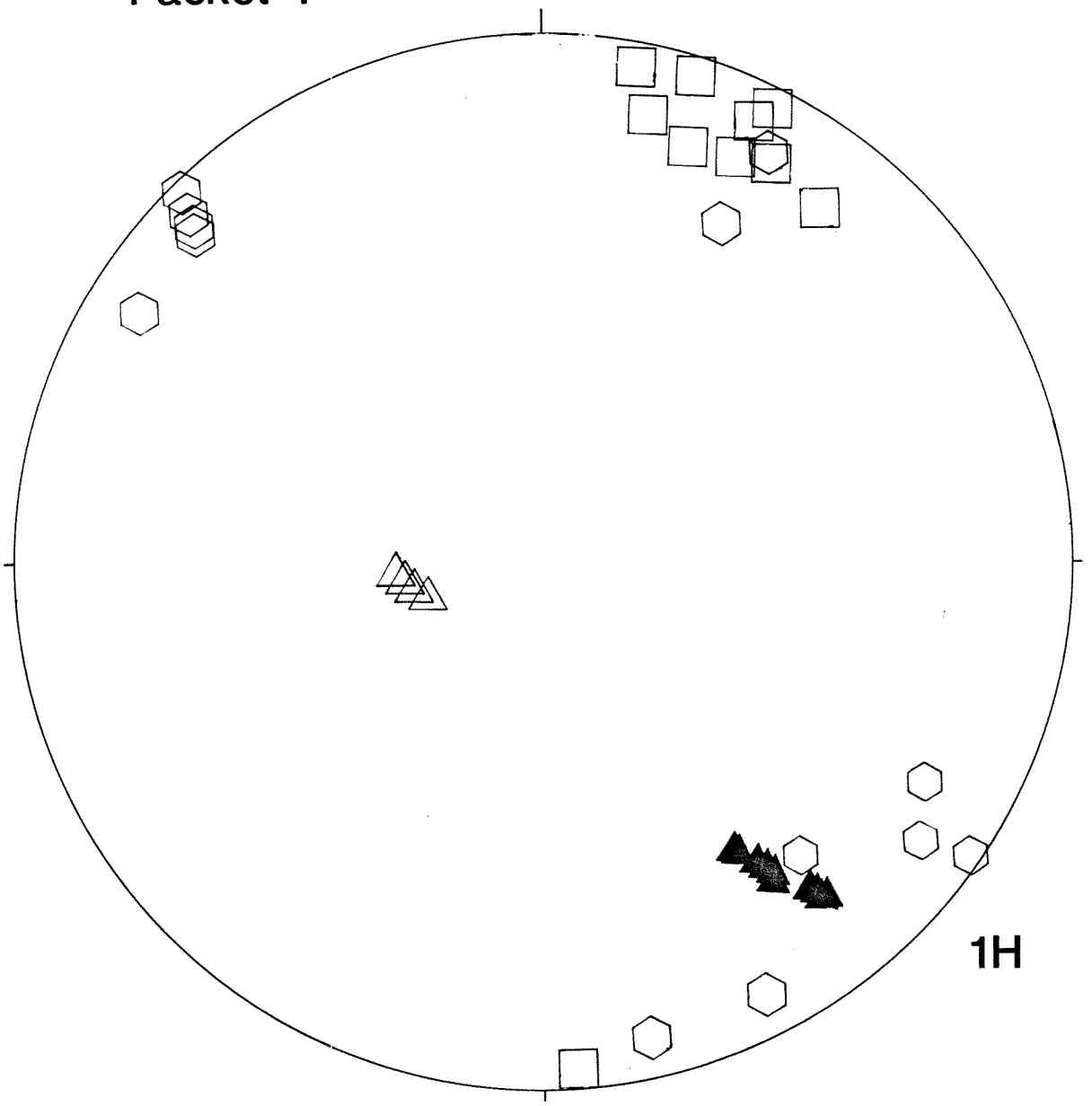

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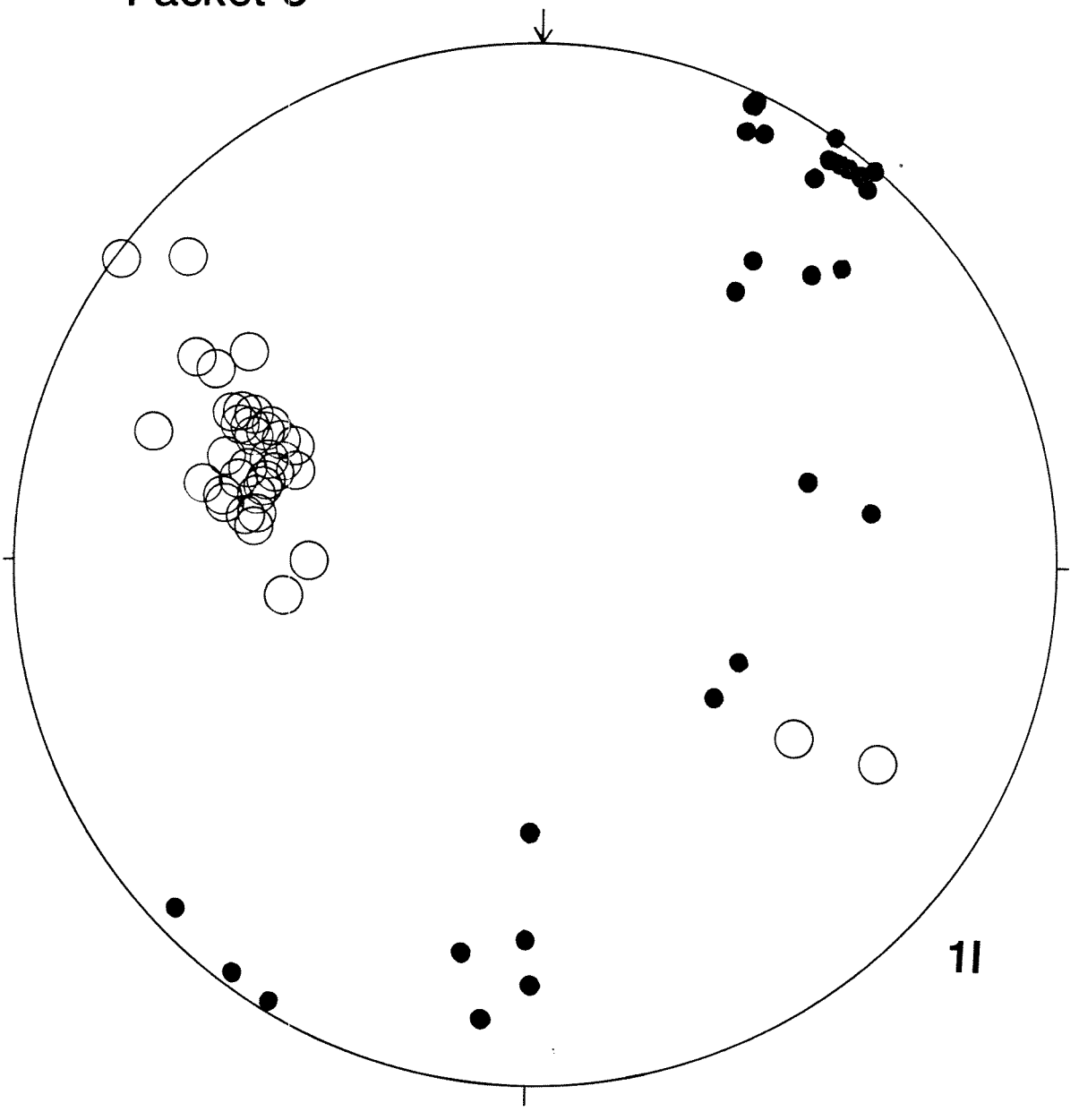

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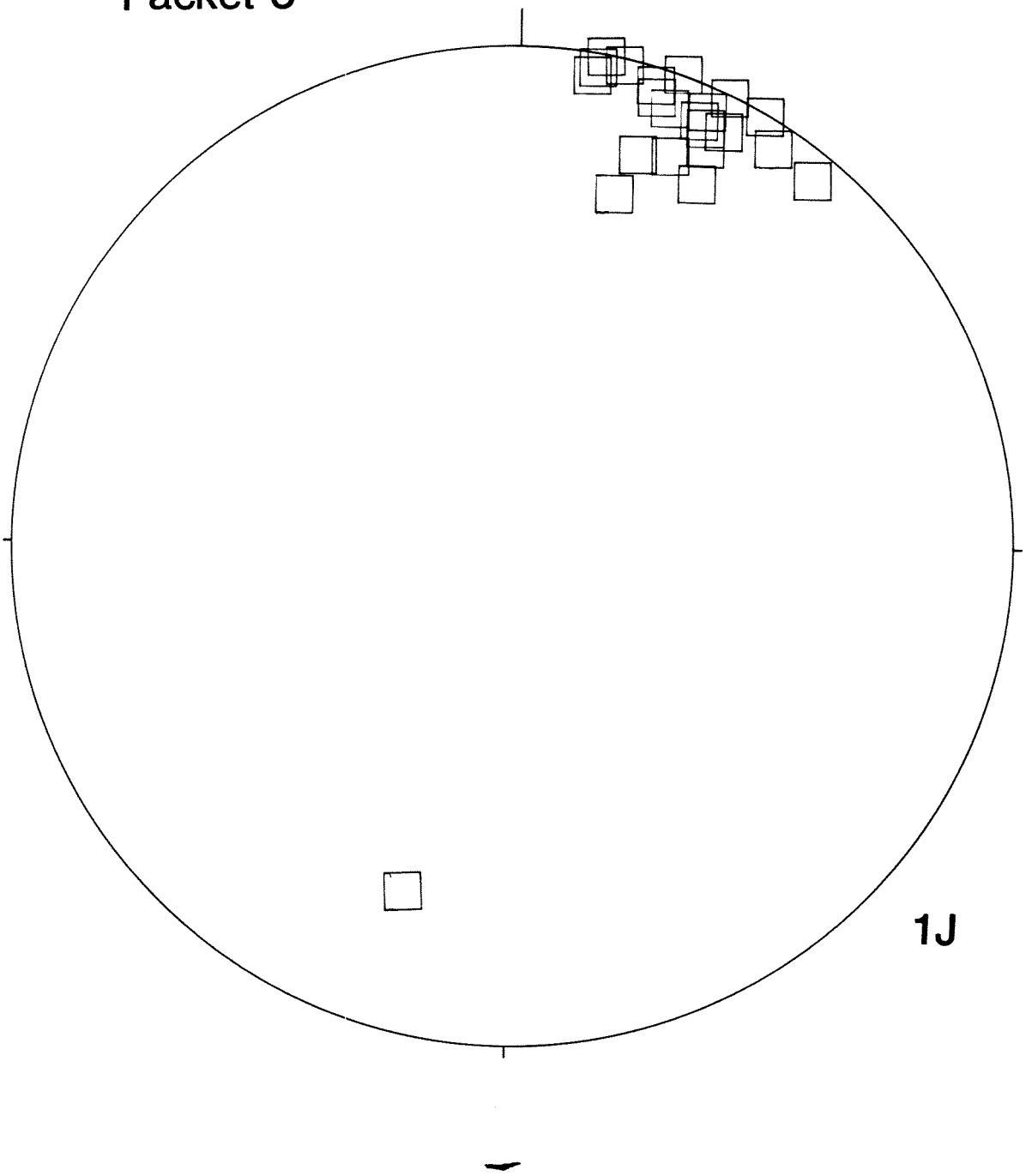

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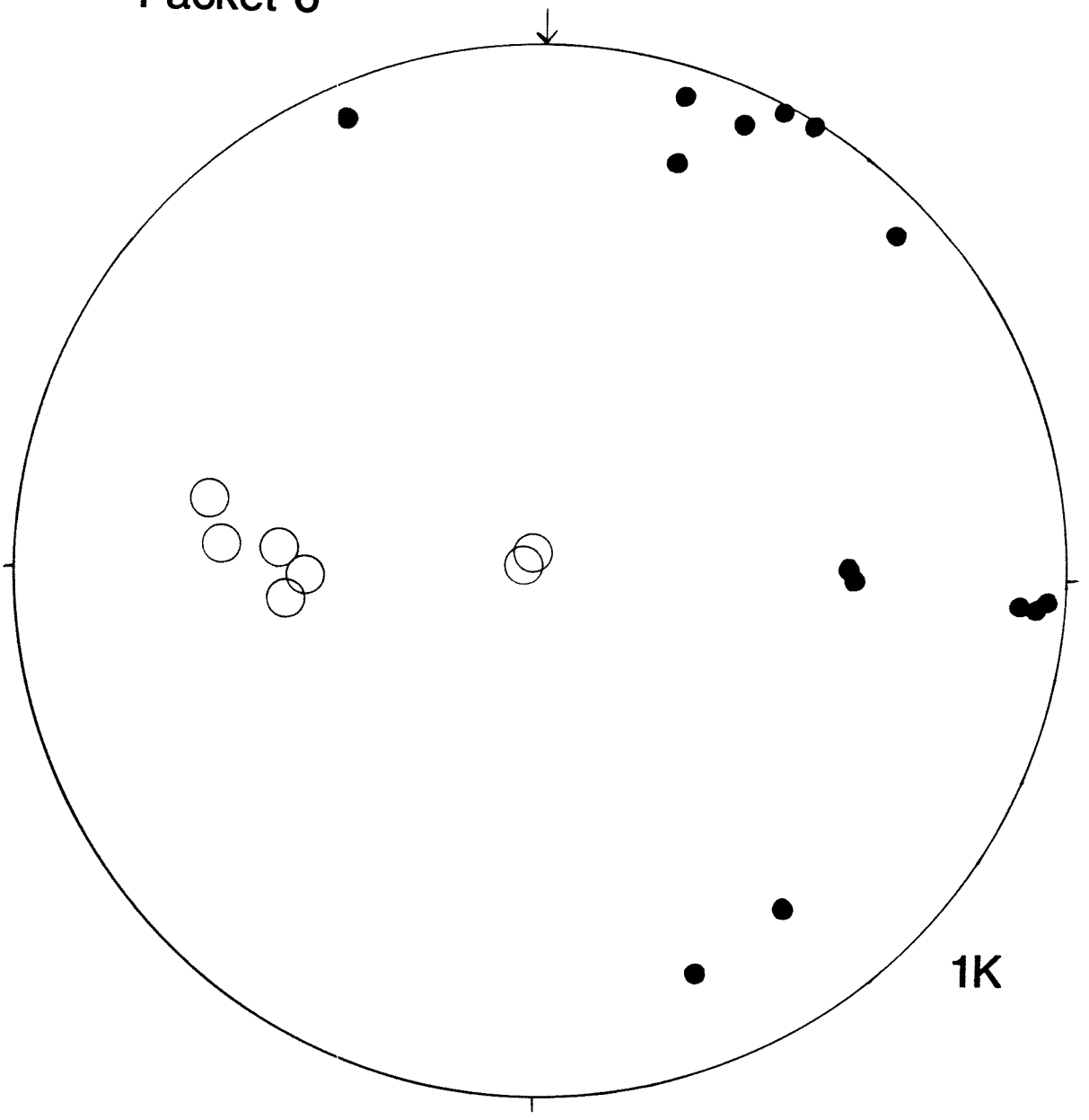

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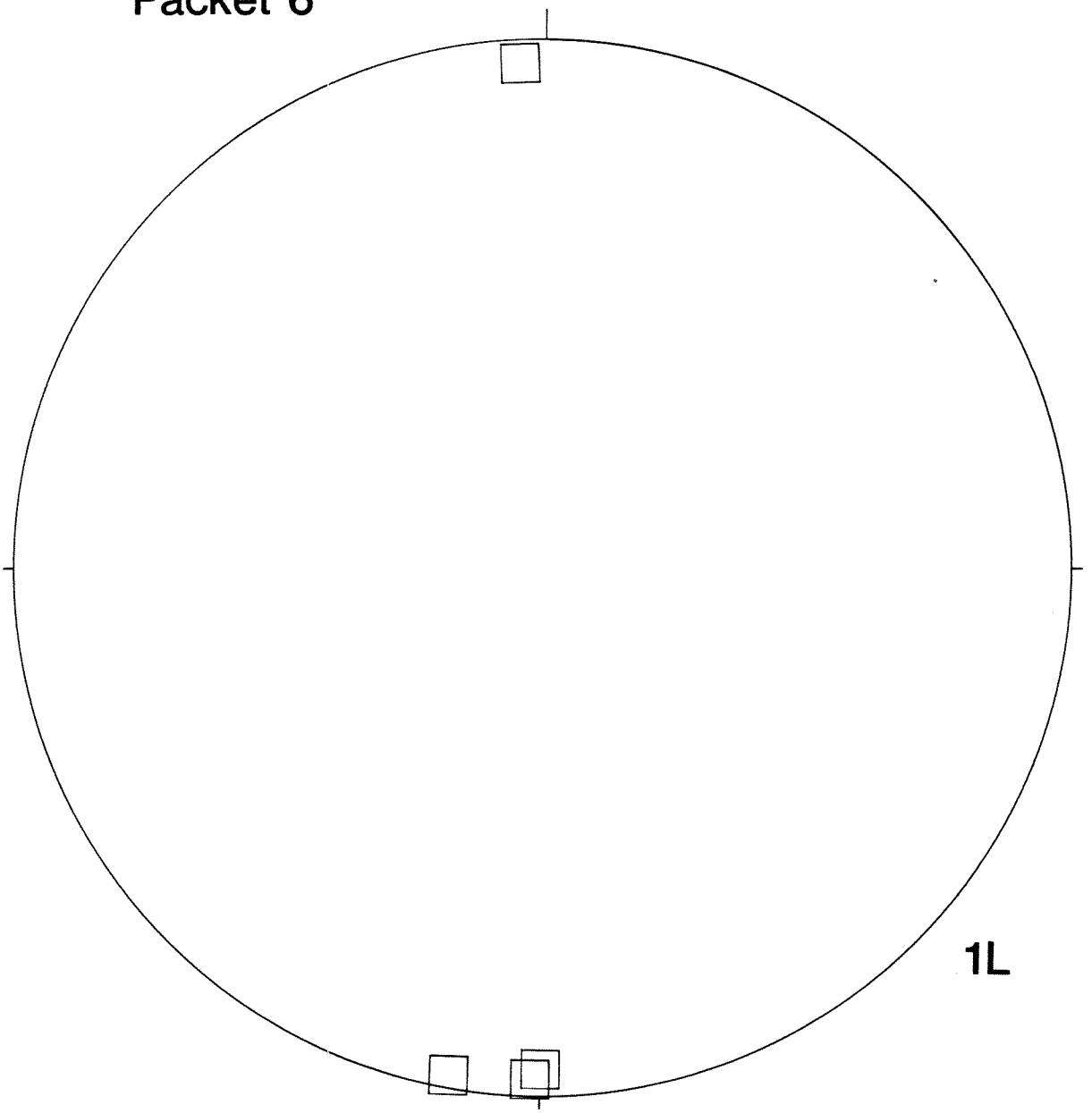

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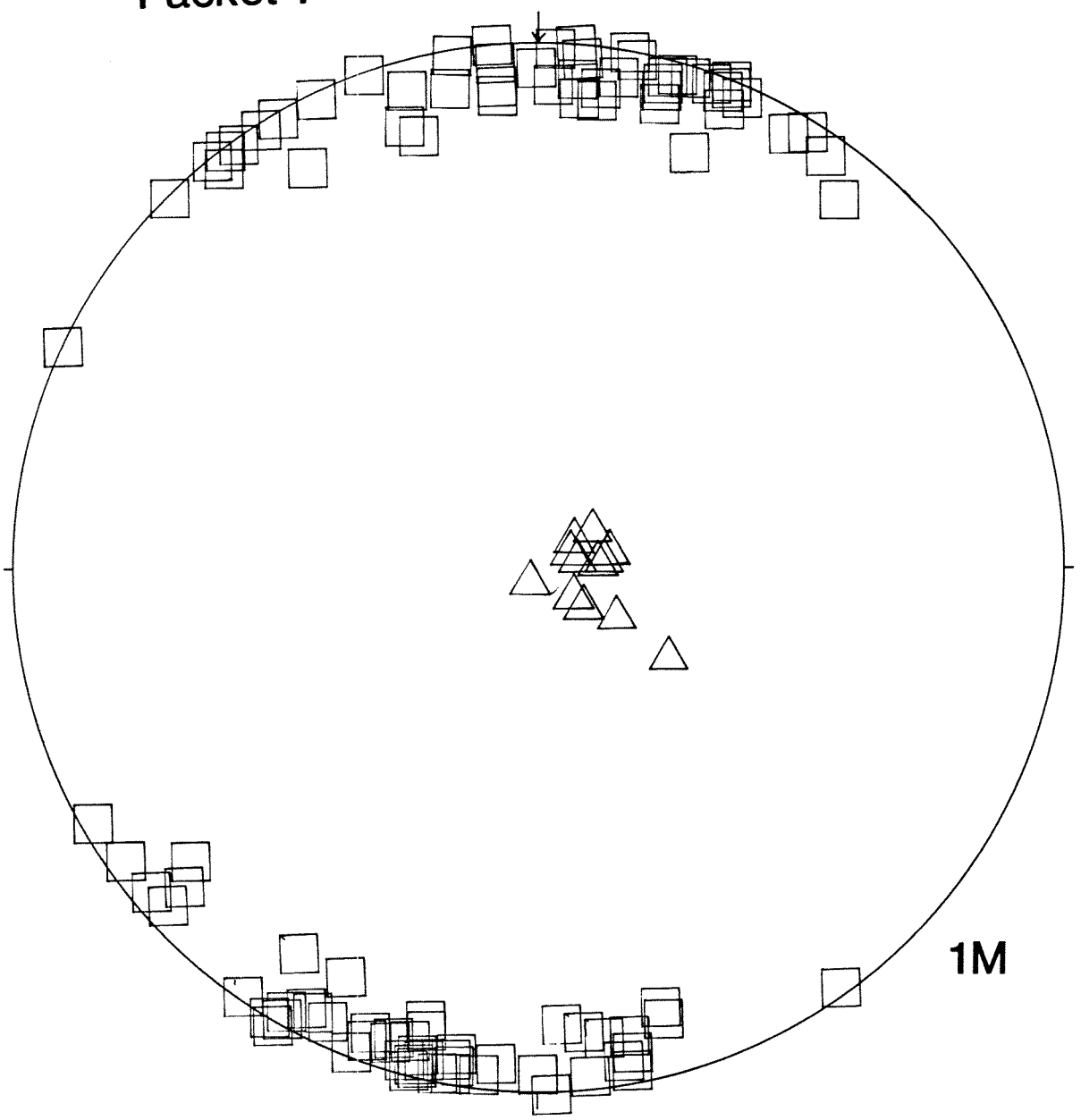

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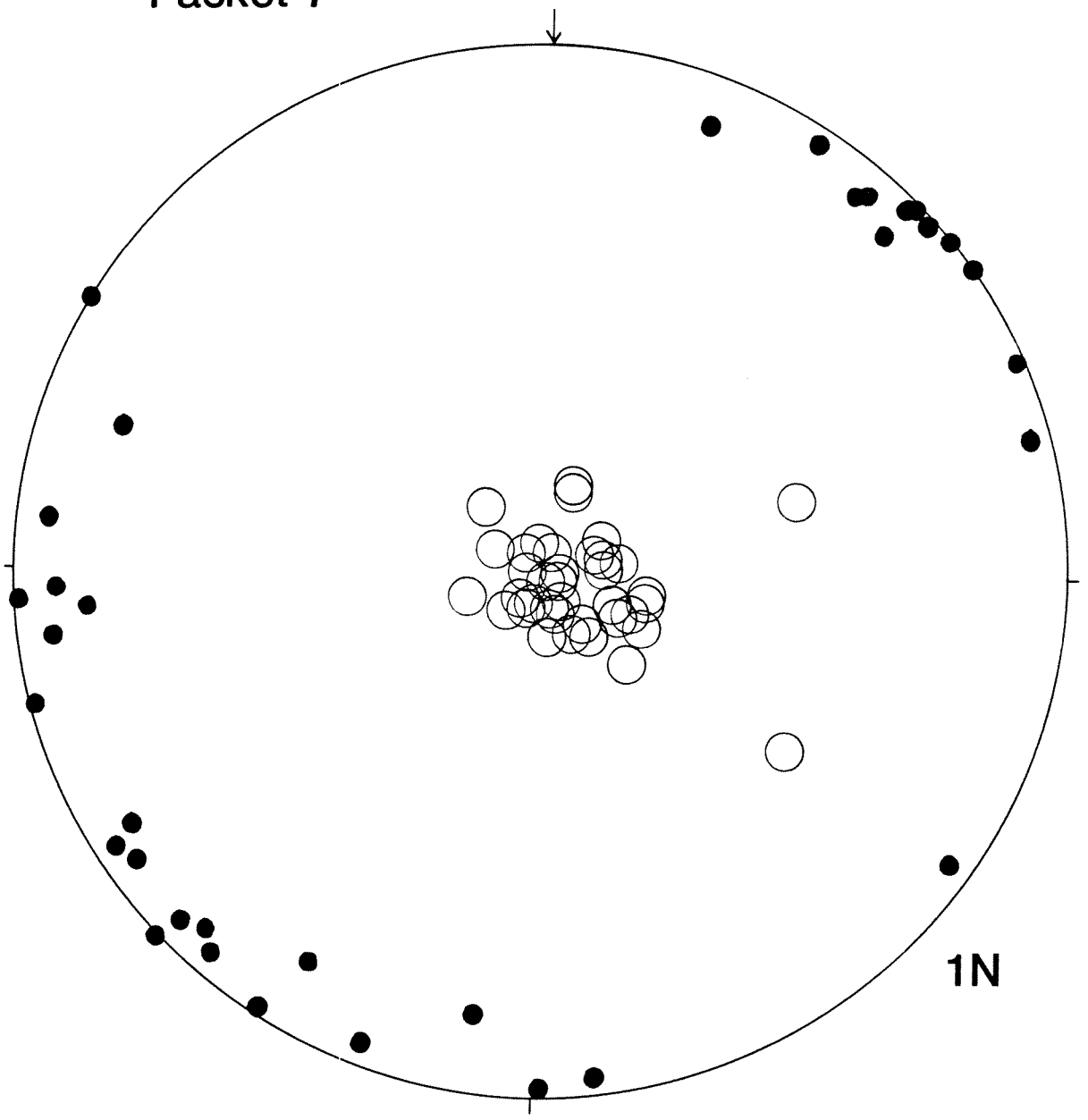

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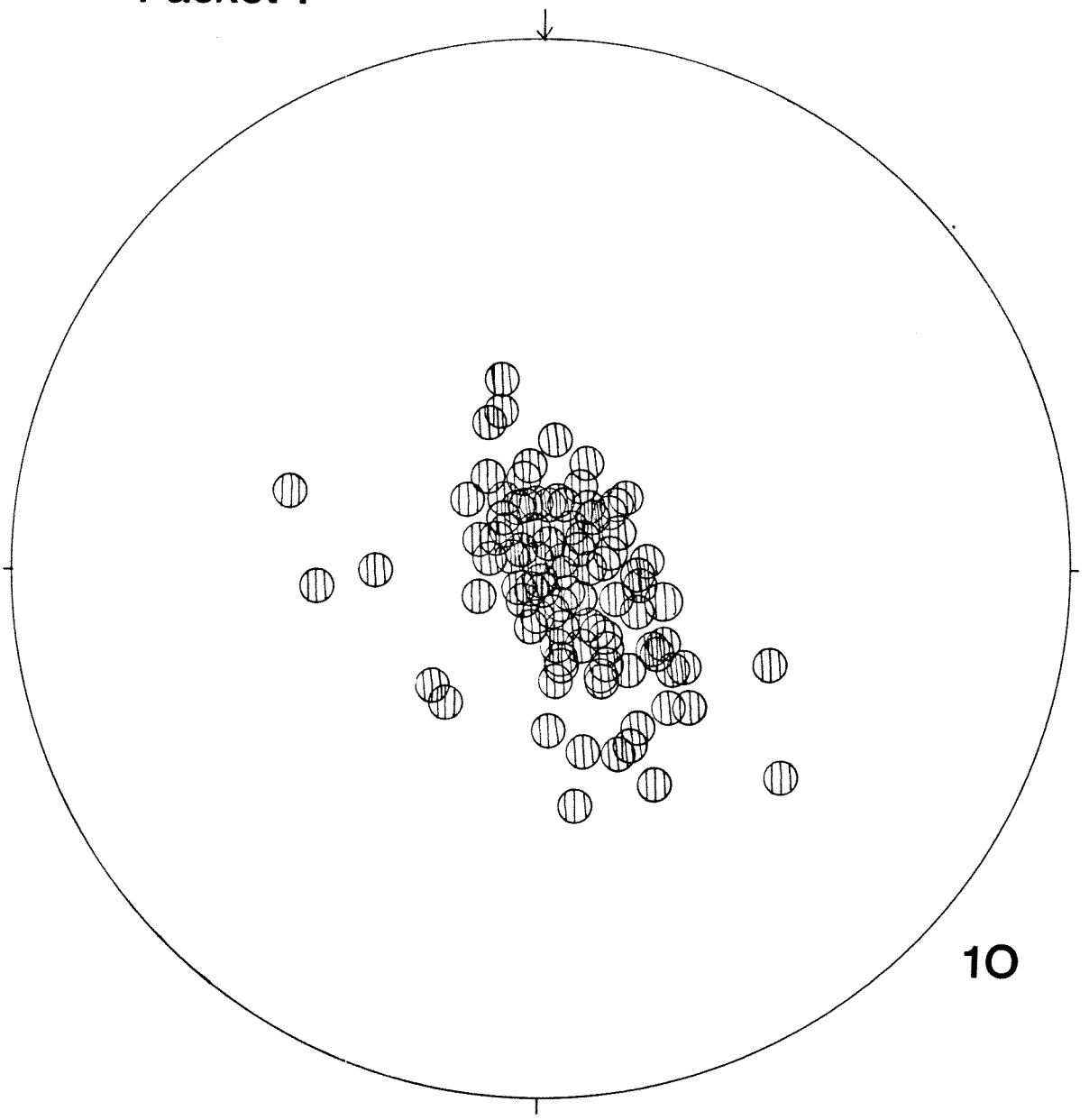

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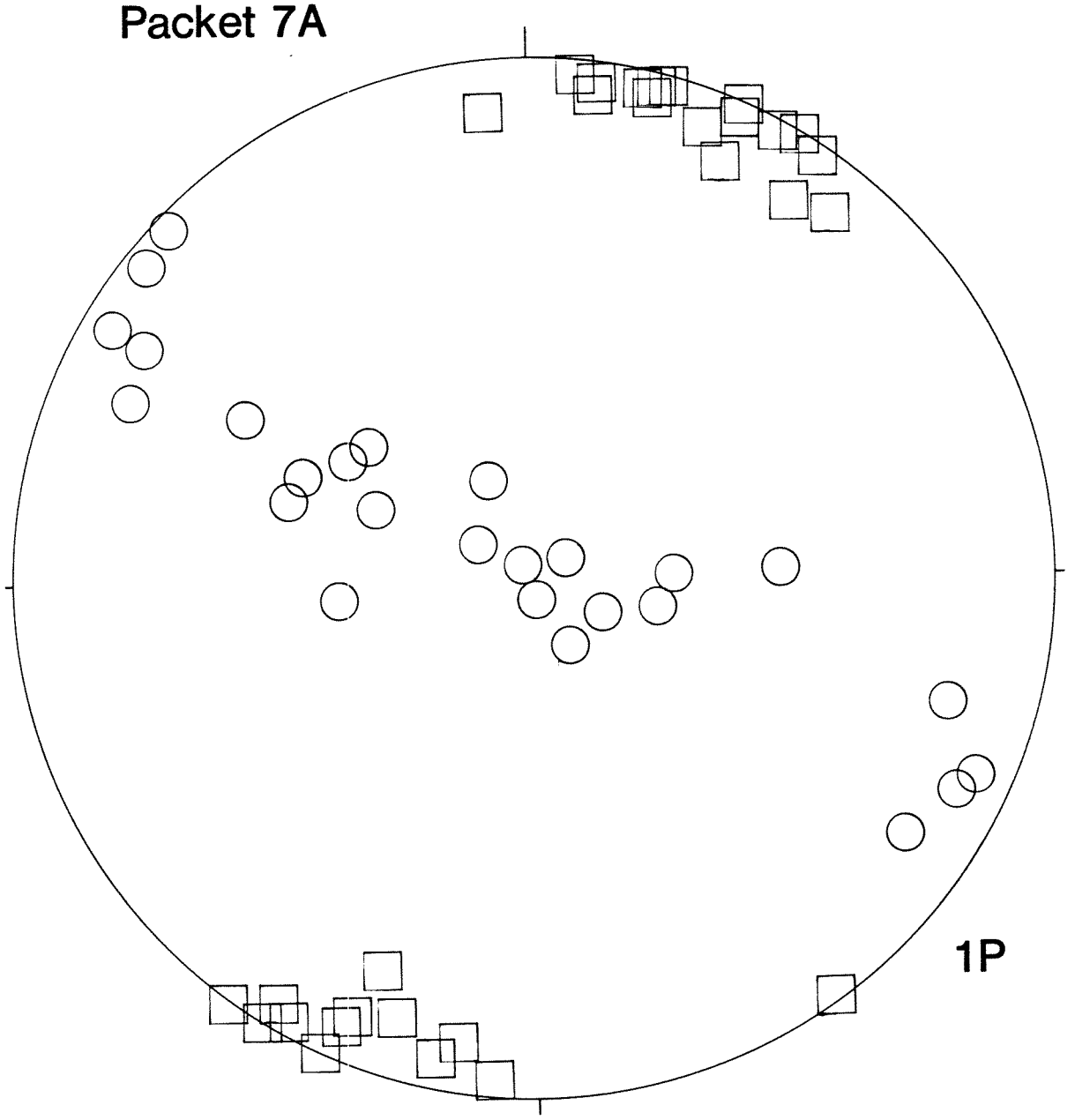

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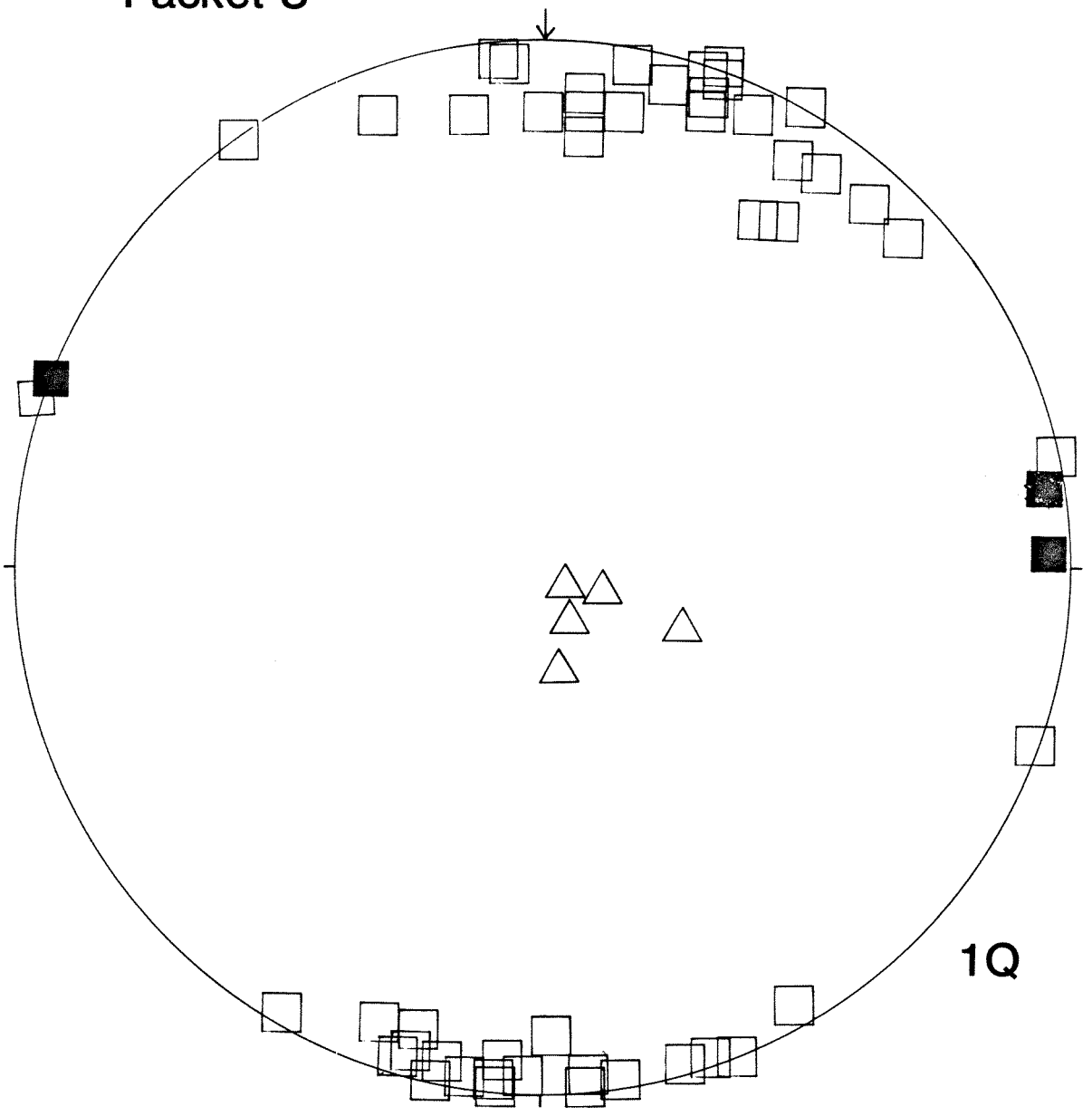

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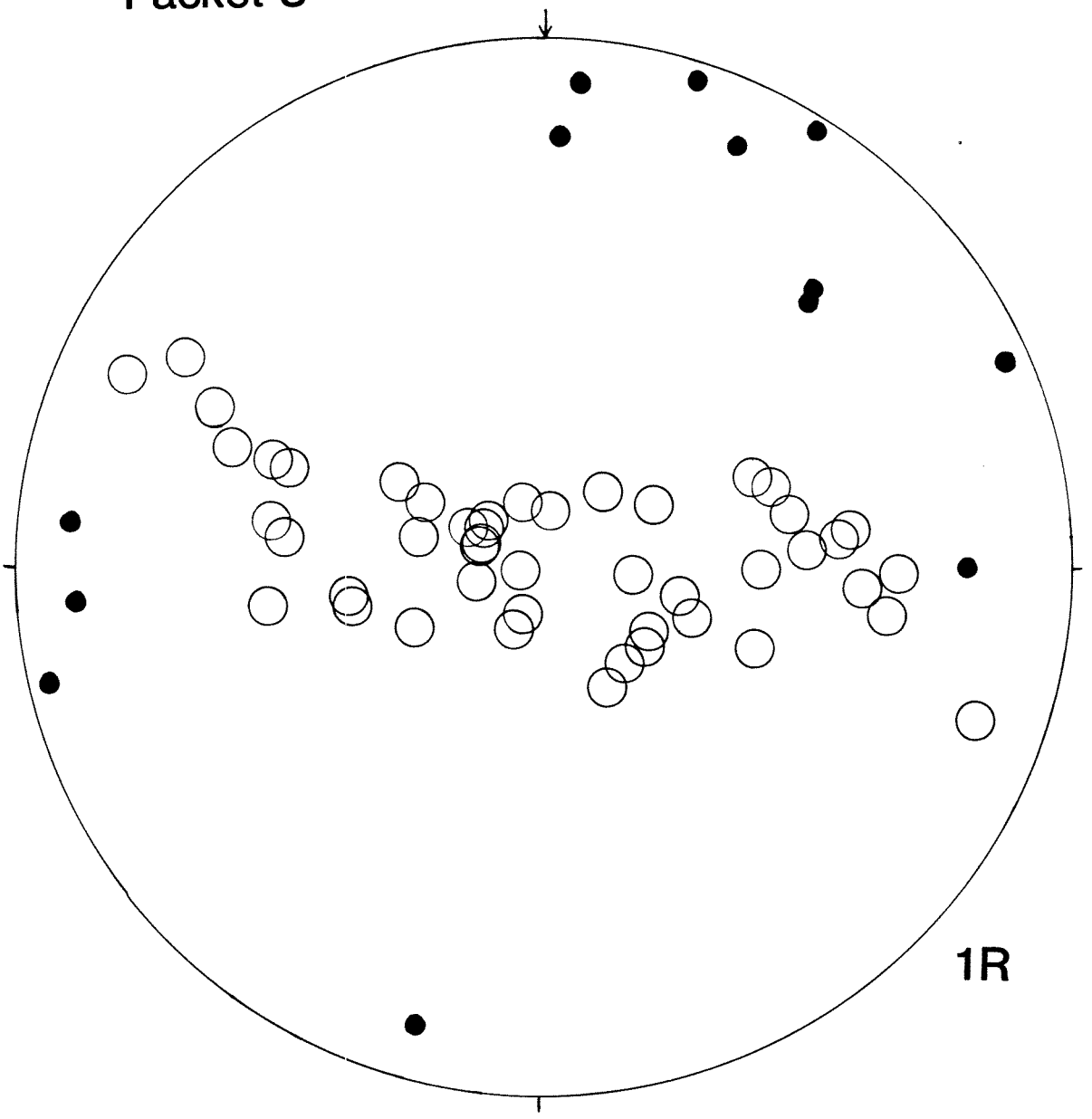

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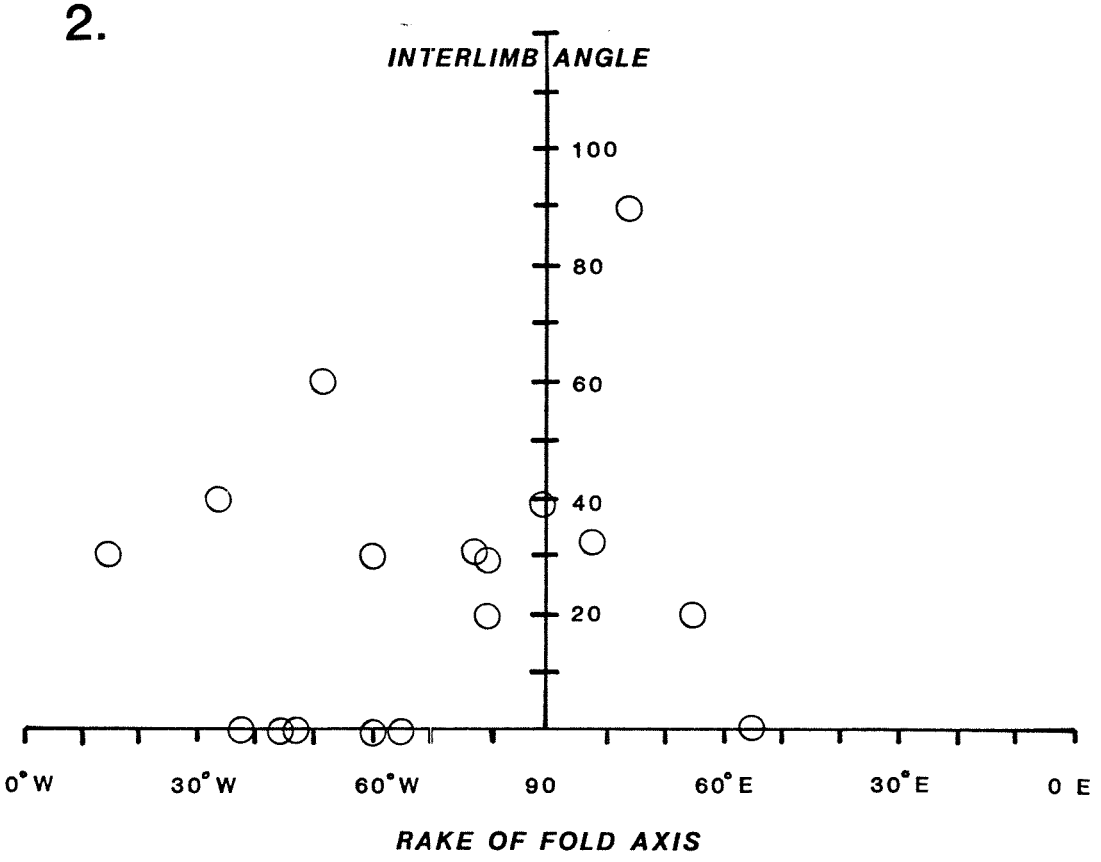
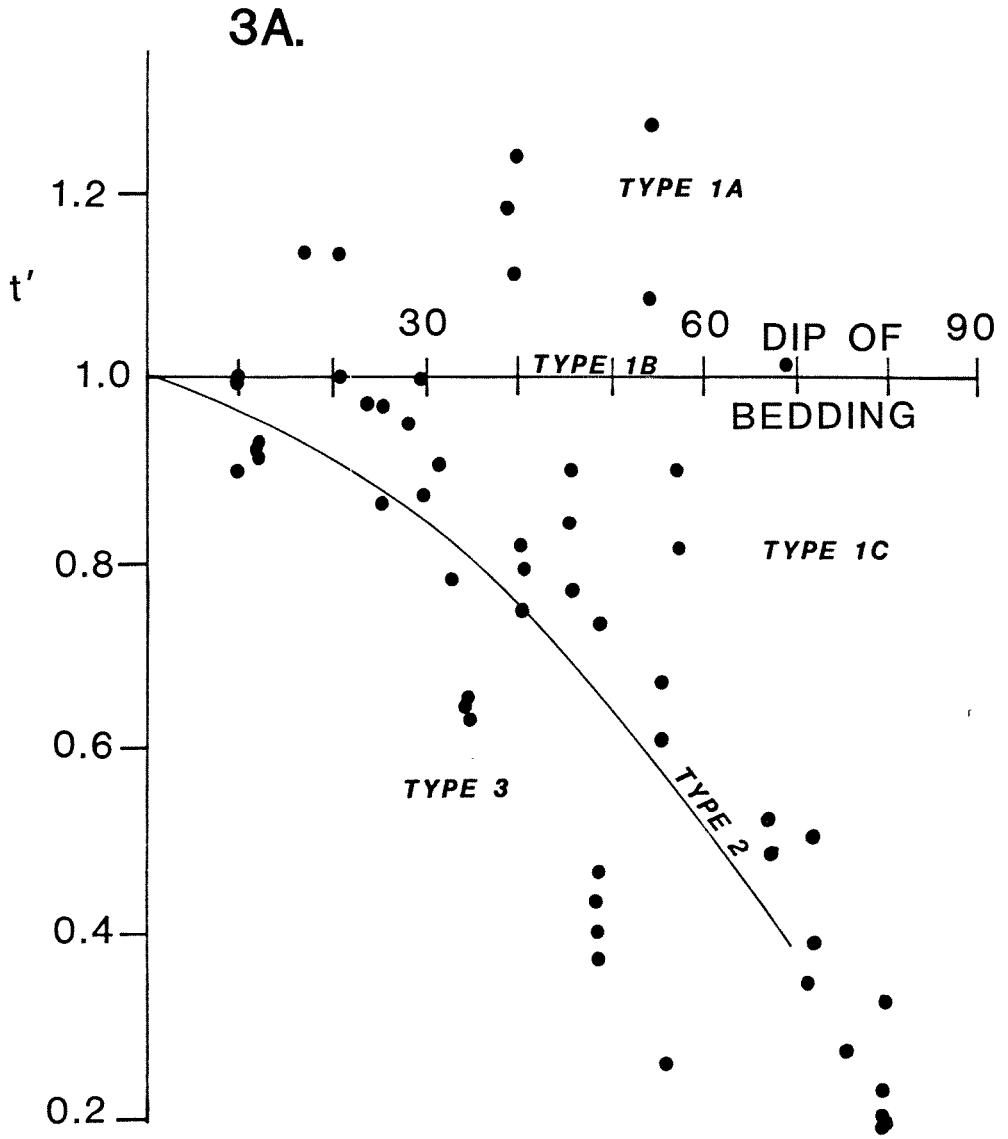

INTERLIMB ANGLE
100
80
60
40
20
0°W
30°W
60°W
90
60°E
30°E
0 E
RAKE OF FOLD AXIS


3A.
t'
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1.0
0.8
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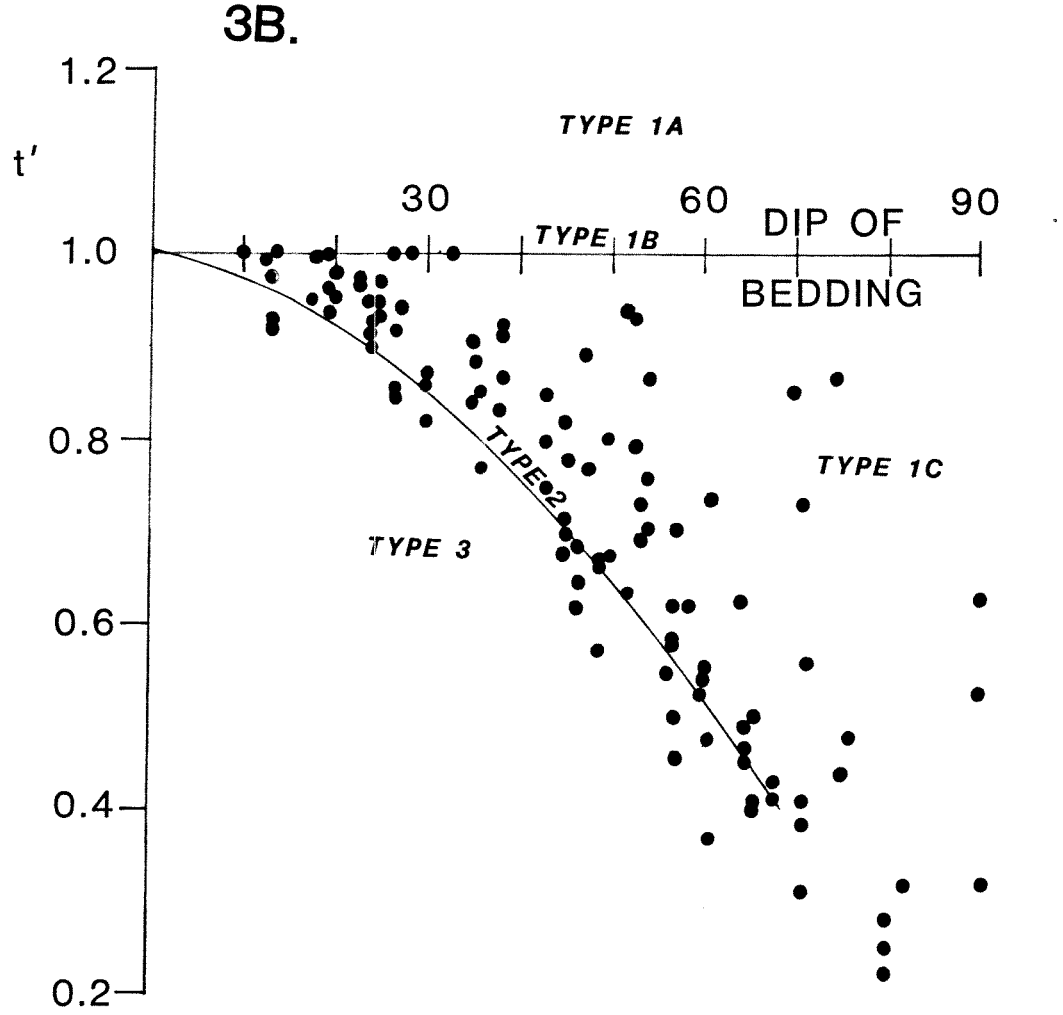
0.2
30
60
90
DIP OF
BEDDING
TYPE 1A
TYPE 1B
TYPE 1C
TYPE 2
TYPE 3


3B.
1.2
t'
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TYPE 1A
30
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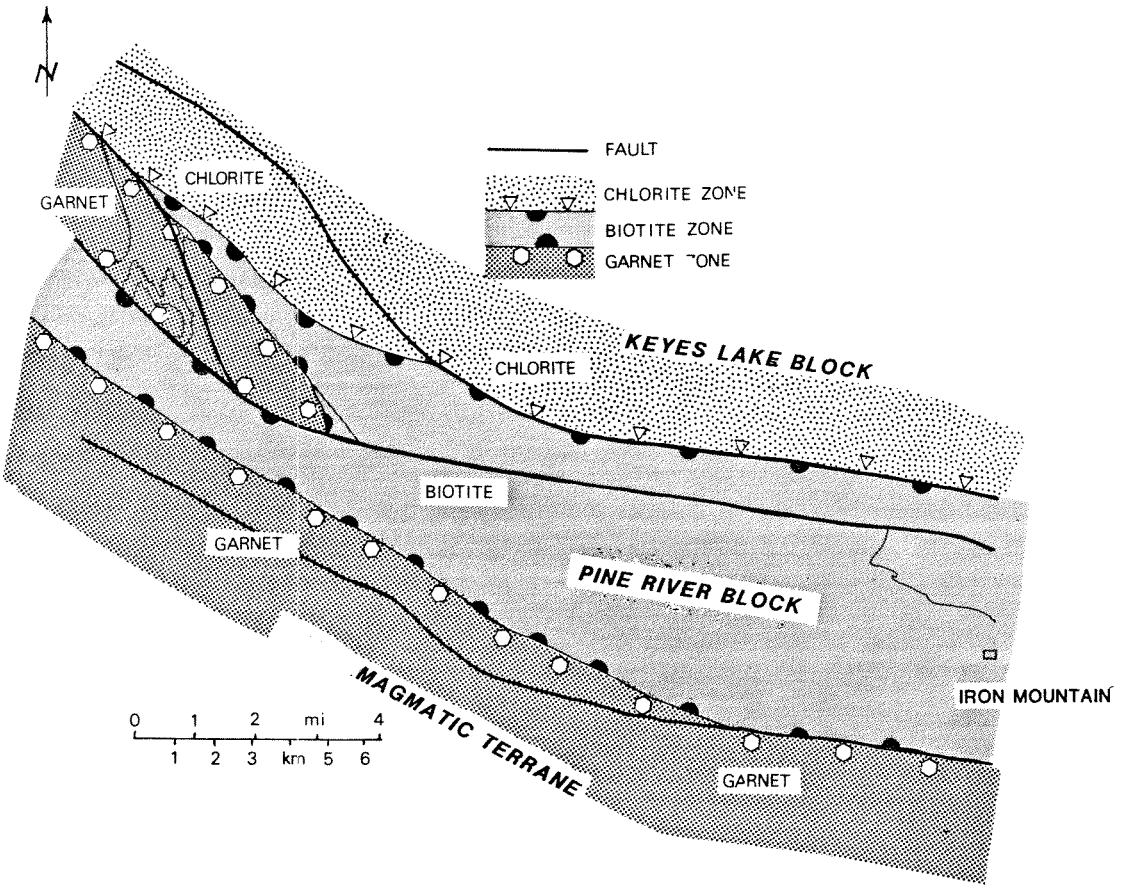
DIP OF
BEDDING
TYPE 1B
TYPE 2
TYPE 1C
TYPE 3

4.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FAULT
CHLORITE ZONE
BIOTITE ZONE
GARNET ZONE
CHLORITE
GARNET
CHLORITE
KEYES LAKE BLOCK
BIOTITE
GARNET
PINE RIVER BLOCK
IRON MOUNTAIN
MAGMATIC TERRANE
GARNET
0 1 2 mi 4
1 2 3 km 5 6