

TOPEX LRA ANALYSIS
STATUS REPORT
11/6/92

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1. TOPEX LRA impulse response function

The impulse response function of the TOPEX array has been computed at 17 incidence angles (0, 2.5, 5, 7.5, 10, 12.5, 15, 17.5, 20, 25, 30, 35, 40, 45, 50, 55, 60 degrees). The results have been transmitted to Tom Varghese at Bendix. The calculations also include the centroid range correction, total intensity and rms width of the pulse although this information is used only for comparison.

2. Comparison of theoretical and measured diffraction patterns.

All of the lab data for tray 1 has been plotted and compared with the theoretical calculations done at SAO and GODDARD. The data was taken at angles of 0, 10, 20, 30, 40, 50, and 60 degrees. Tray 1 was not included in the results presented at the last meeting. In addition to the gray scale plots, the total signal, active reflection area, and peak intensity have been plotted. Lab data has been plotted at two exposure levels to pick up faint detail on weak frames.

3. Results of comparisons.

A. The SAO calculations appear to be in approximate agreement with the lab data under the assumption that the lab data is mislabeled such that 0, 10, 20, 30, 40, 50, and 60 degrees are really 80, 70, 60, 50, 40, 30, and 20 degrees respectively.

B. No consistent way has been found of reconciling the GODDARD theoretical calculation with the lab data or the SAO calculations.

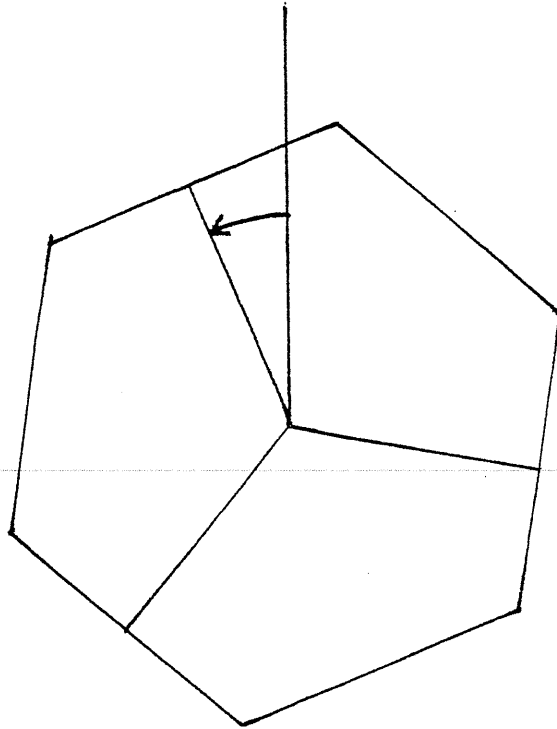
C. In the SAO calculations the active reflecting area and total signal are lower at 50 degrees than at 30 degrees. The 60 and 20 degrees data also show the same effect. In the lab data the effect is reversed. The total intensity is greater at 50 degrees than at 30 and similarly the 60 degree data is stronger than the 20 degree data. This is unphysical since the retros away from the point of closest approach are being seen at larger incidence angles for the 50 and 60 cases than the 30 and 20 degrees cases.

D. In the lab data the strongest signal for the 11.25 azimuth data occurs around the middle of the tray instead of at the end which should be closest to normal incidence. This effect is observed at all incidence angles. This result is also unphysical with respect to the assumptions as to how the trays are positioned for measurement.

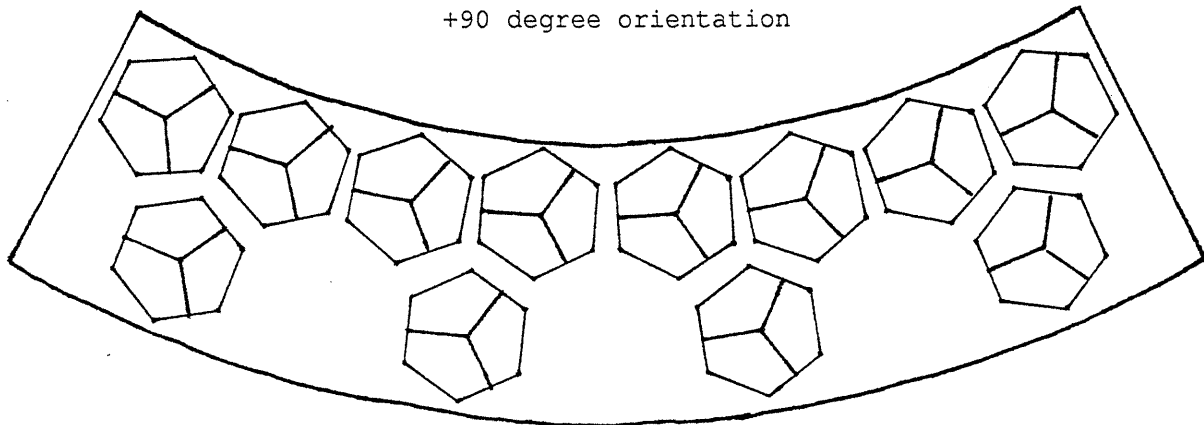
E. The lab data was taken at too low signal levels for all but the retros close to normal incidence. The 0 degrees data is completely blank. In the 10 degrees data, the 33.75 azimuth data is completely blank and the 11.25 data is weak. At 20 degrees the 33.75 azimuth is very weak with maximum signal levels in the single digits. At 40 degrees the signals are adequate for the 11.25 and -11.25 azimuths, but the signal levels at the ends of the 33.75 and -33.75 data are down around 10 which does not give adequate resolution of the fainter parts of the pattern. The 50 and 60 degree data is weak at the ends. The maximum signal levels for all of the data is less than 90. The possible range of values is from 0 to 255.

F. The GODDARD theoretical calculations for 40 degrees show an abrupt change in angle of the diffraction pattern between retros 20 and 21 in the first row. This is unphysical since there is no mechanism to cause an abrupt change in the pattern. Uncoated retros can show a sudden change when total internal reflection is lost.

Definition of retro orientation



+90 degree orientation



UNITS

1. Active reflecting area.

The active reflecting area is normalized to unity at normal incidence.

2. Intensity.

A. SAO

The intensity is normalized to unity at the center of the far field diffraction pattern of a perfect retro at normal incidence.

B. GODDARD

The intensity is the cross-section divided by 1.E7

C. Lab data

The intensity is an integer between 0 and 255.

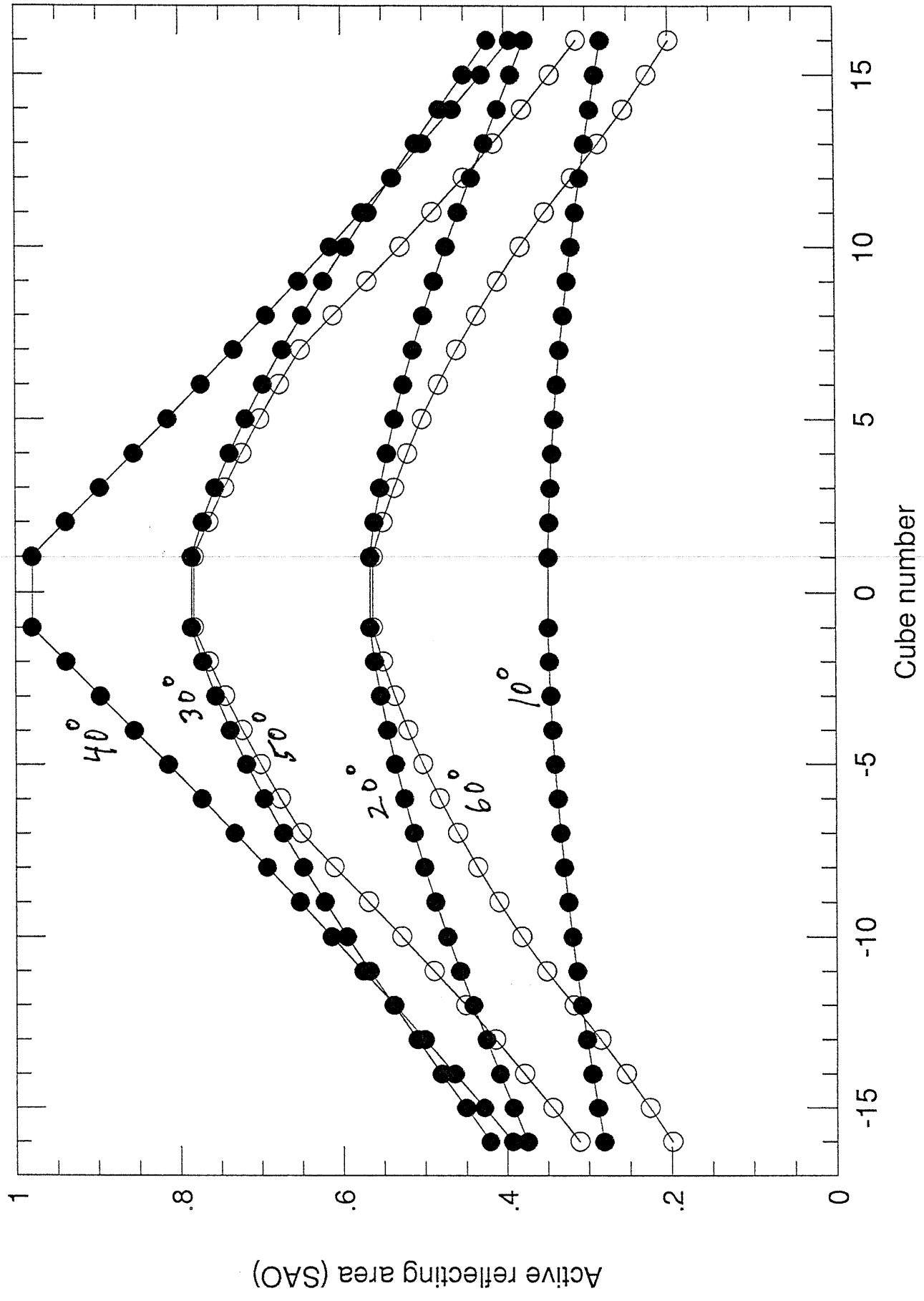
3. Total signal.

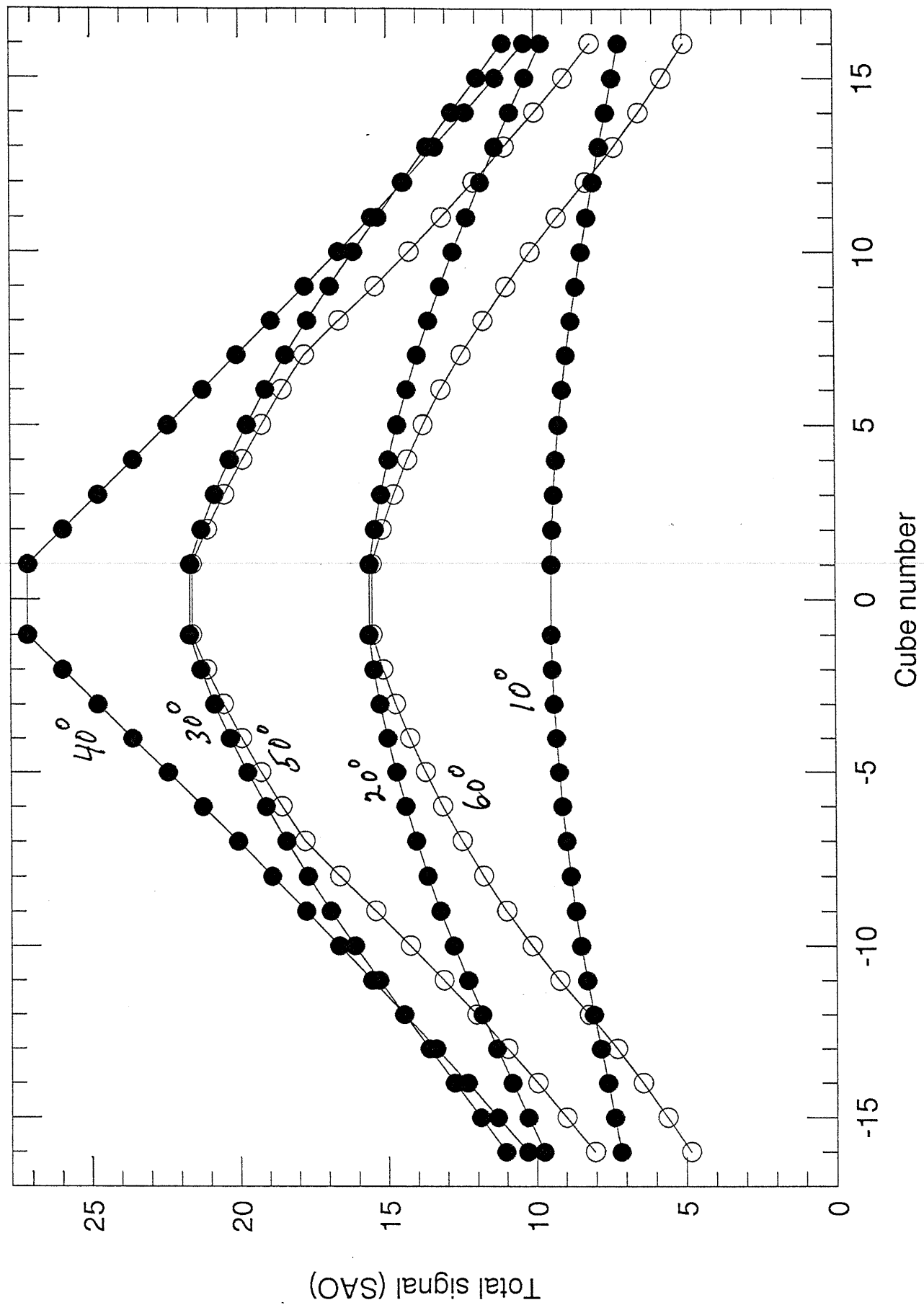
The total signal is the sum of all the intensities in the pattern and is in the same units used for the intensity. The sum depends on the grid size used for the computation. For the SAO data, the total intensity can be calculated theoretically using the expression

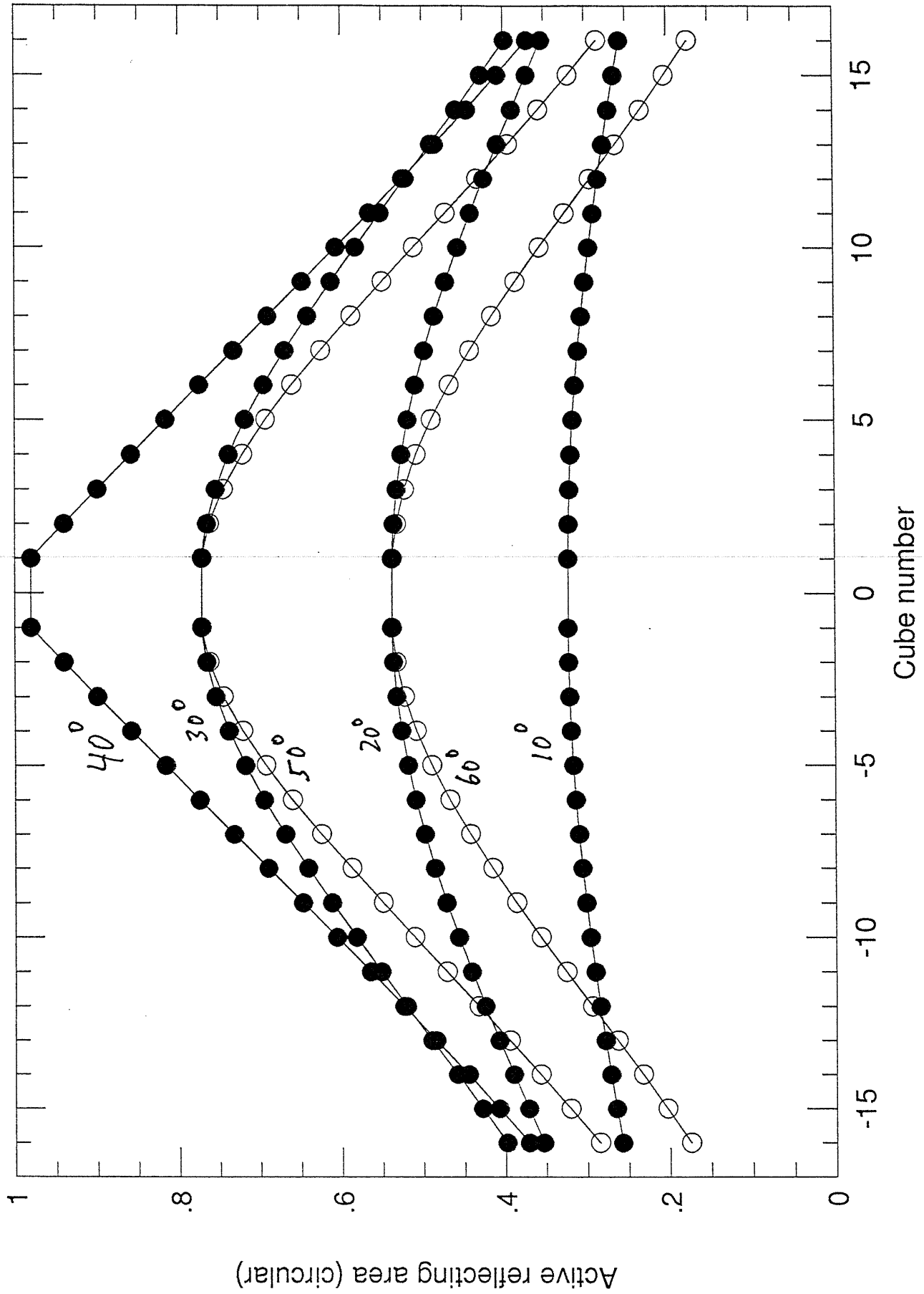
$$\sum I = \frac{\lambda^2}{dsr A}$$

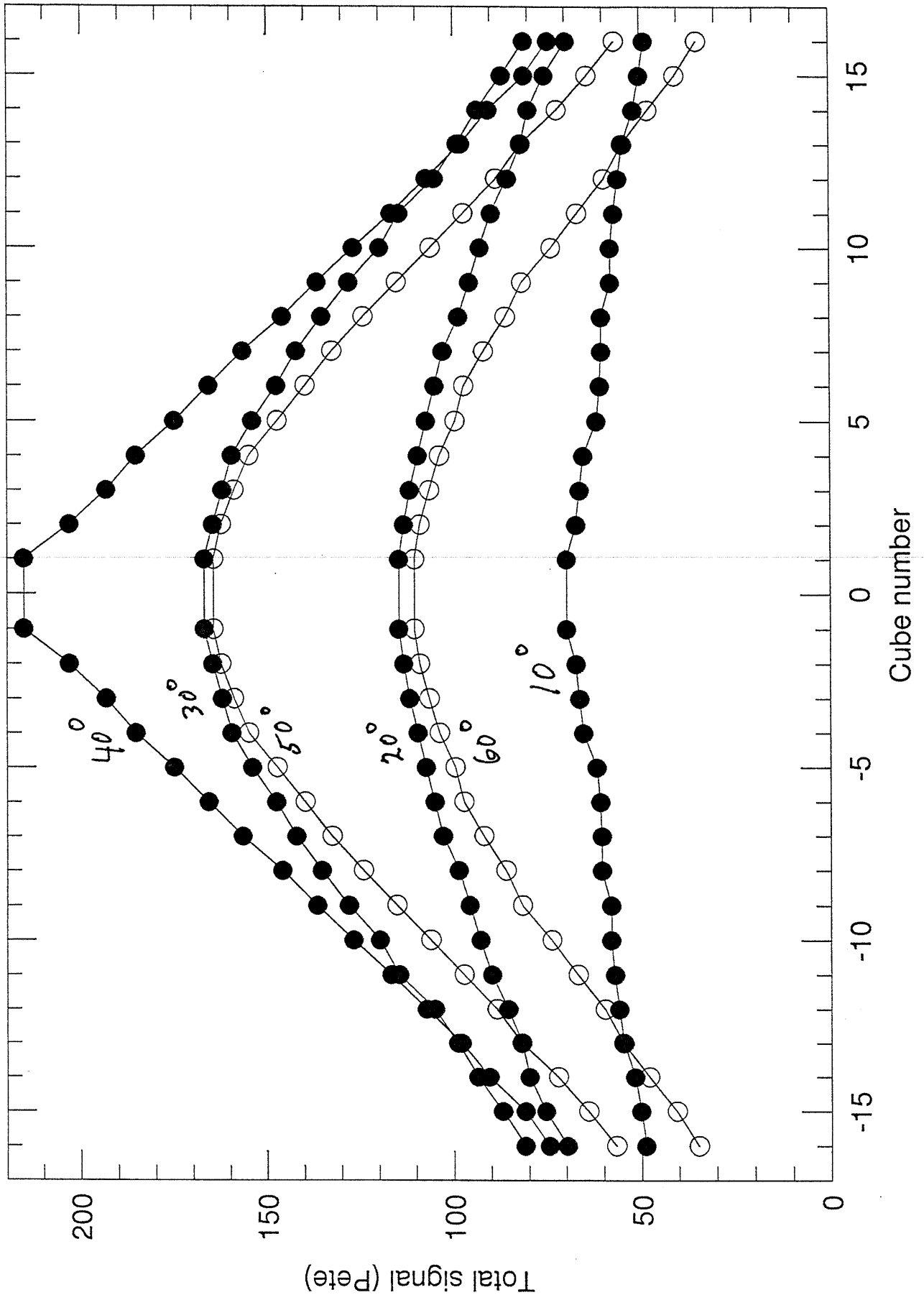
where I is the intensity, λ is the wavelength, dsr is the solid angle represented by one point, and A is the area of the front face of the retro. For the SAO calculations the wavelength is 6328 angstroms for the calculations used to compare with the lab data. The area of the front face is 12.505 sq cm. The grid spacing is $80/50 = 3.2$ microradians. For a retro at normal incidence the total intensity given by the theoretical expression is 31.27. For the closest retro at the 40 degree incidence angle the active reflecting area is .9795 so that the total intensity should be $31.27 \times .9795 = 30.63$. The total intensity obtained by summing all the points in the pattern is 27.4. For this case the square from -80 to +80 microradians contains 88.6 percent of the total reflected energy. The total reflected energy is proportional to the active reflecting area. The amount contained within a given field of view depends on the width of the diffraction pattern. The width increased as the active reflecting area decreases. Since the dihedral angles are offset from 90 degrees, the pattern does not widen significantly until the diffraction width becomes larger than the beam width due to the dihedral angle offsets.

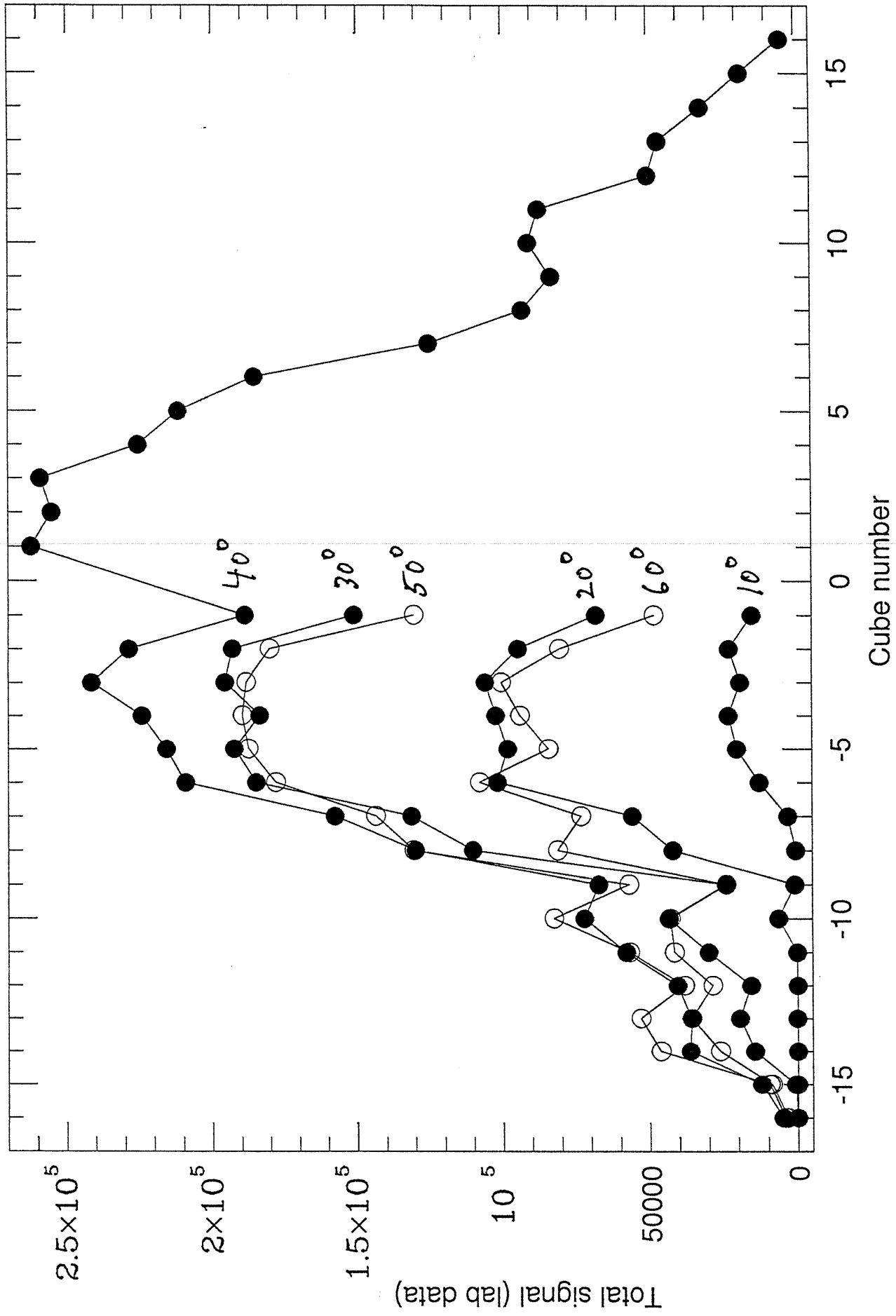
The grid size for the lab data is one microradian. The pattern is 160 X 160 and covers an area from -80 to +80 microradians.

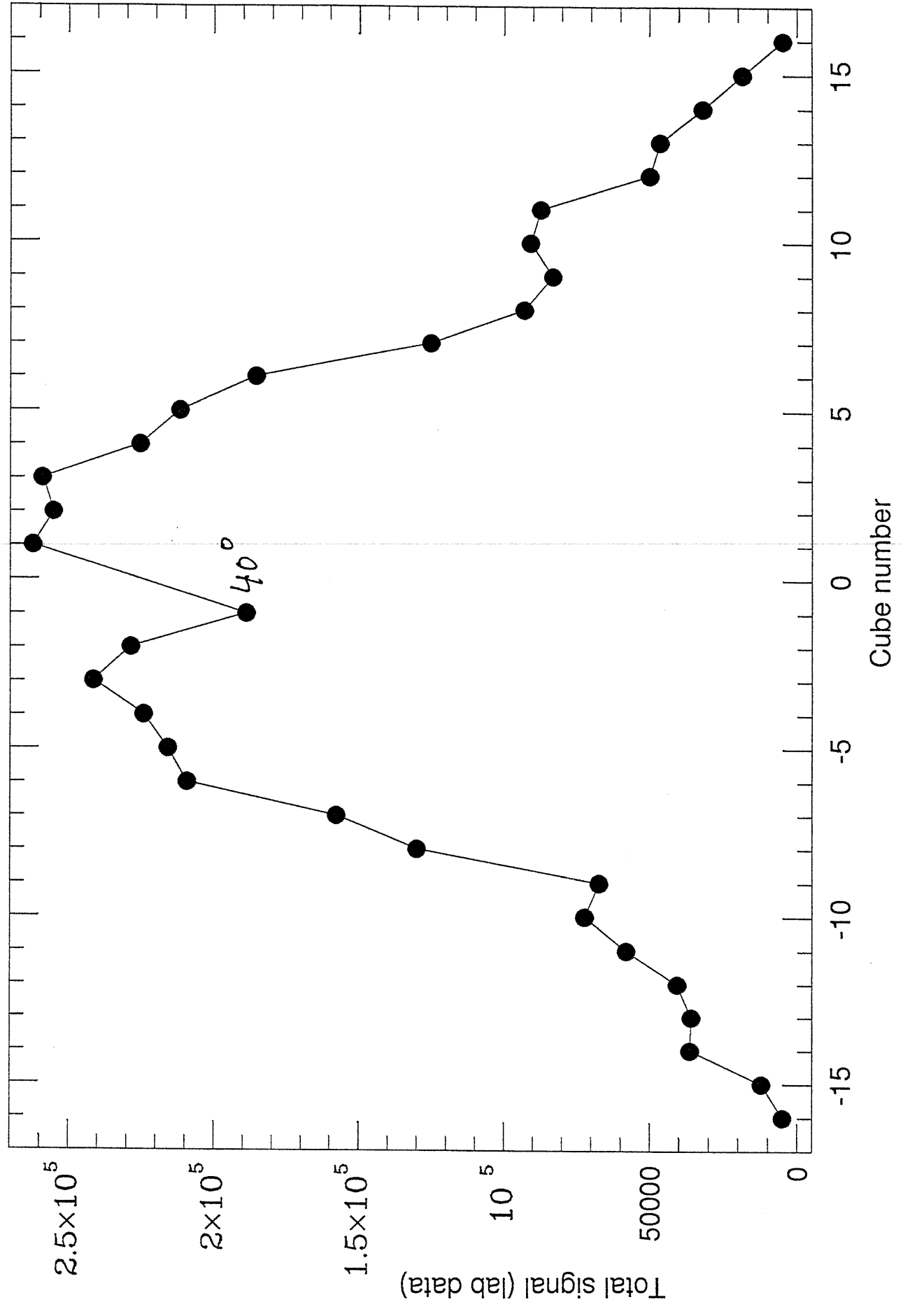


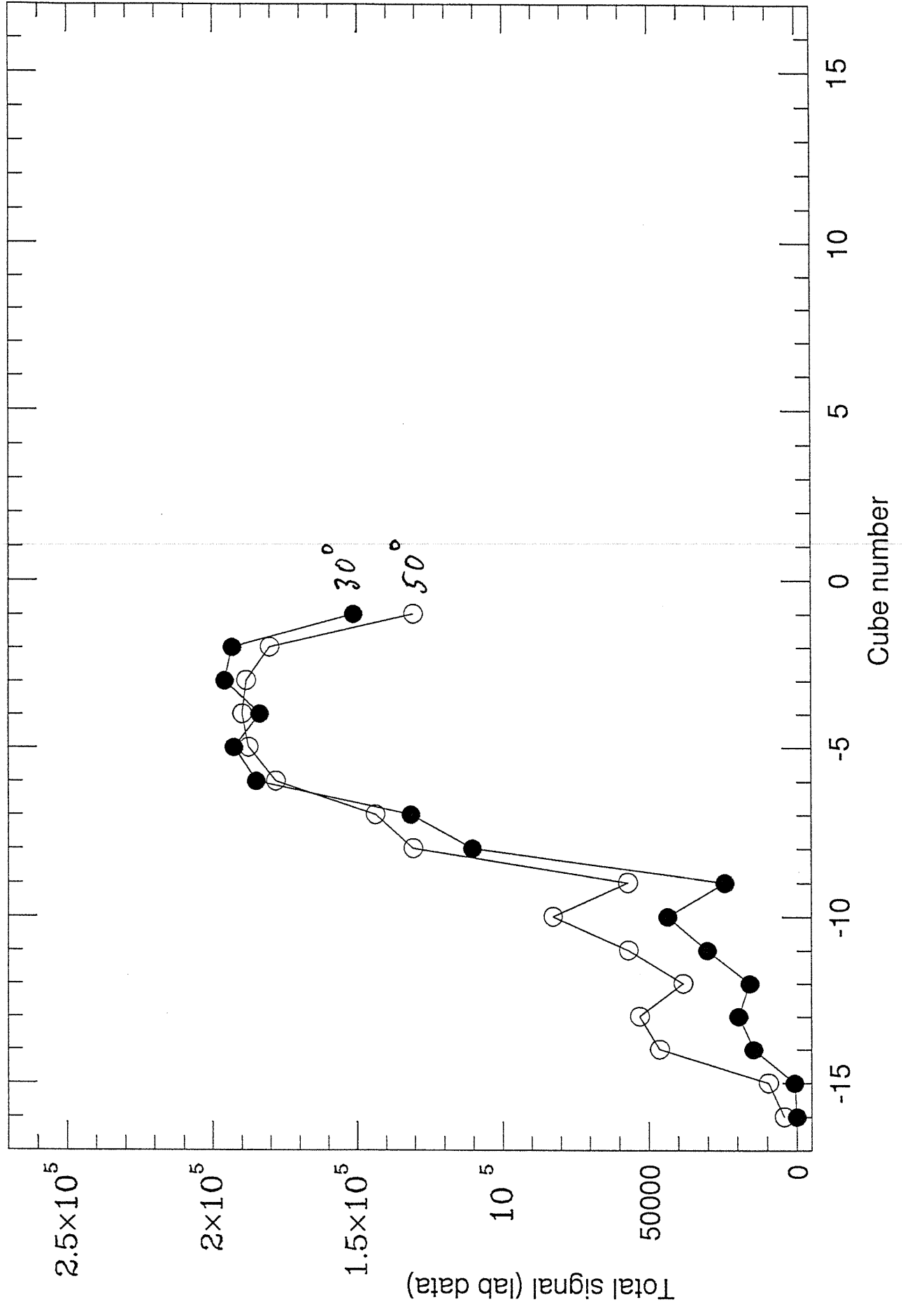


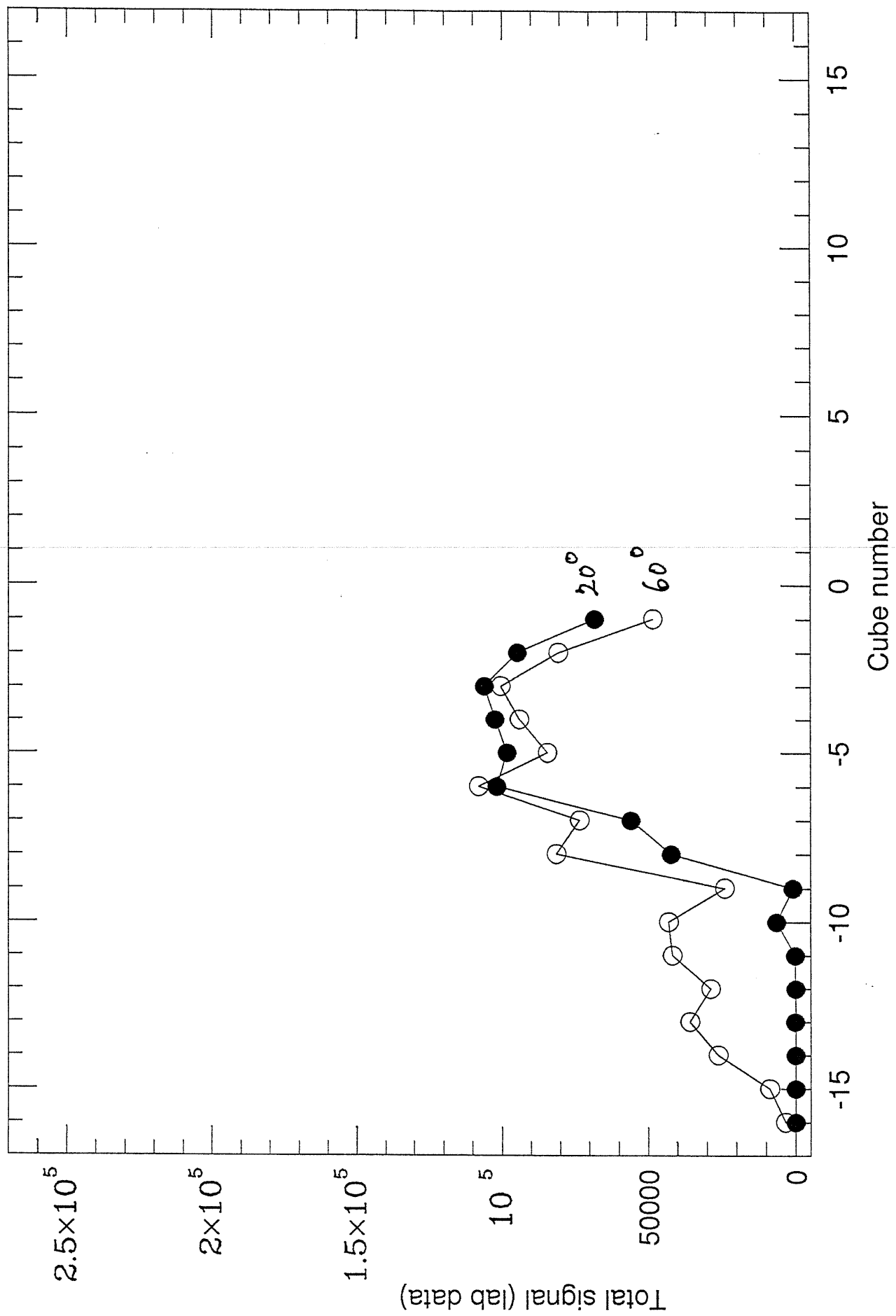


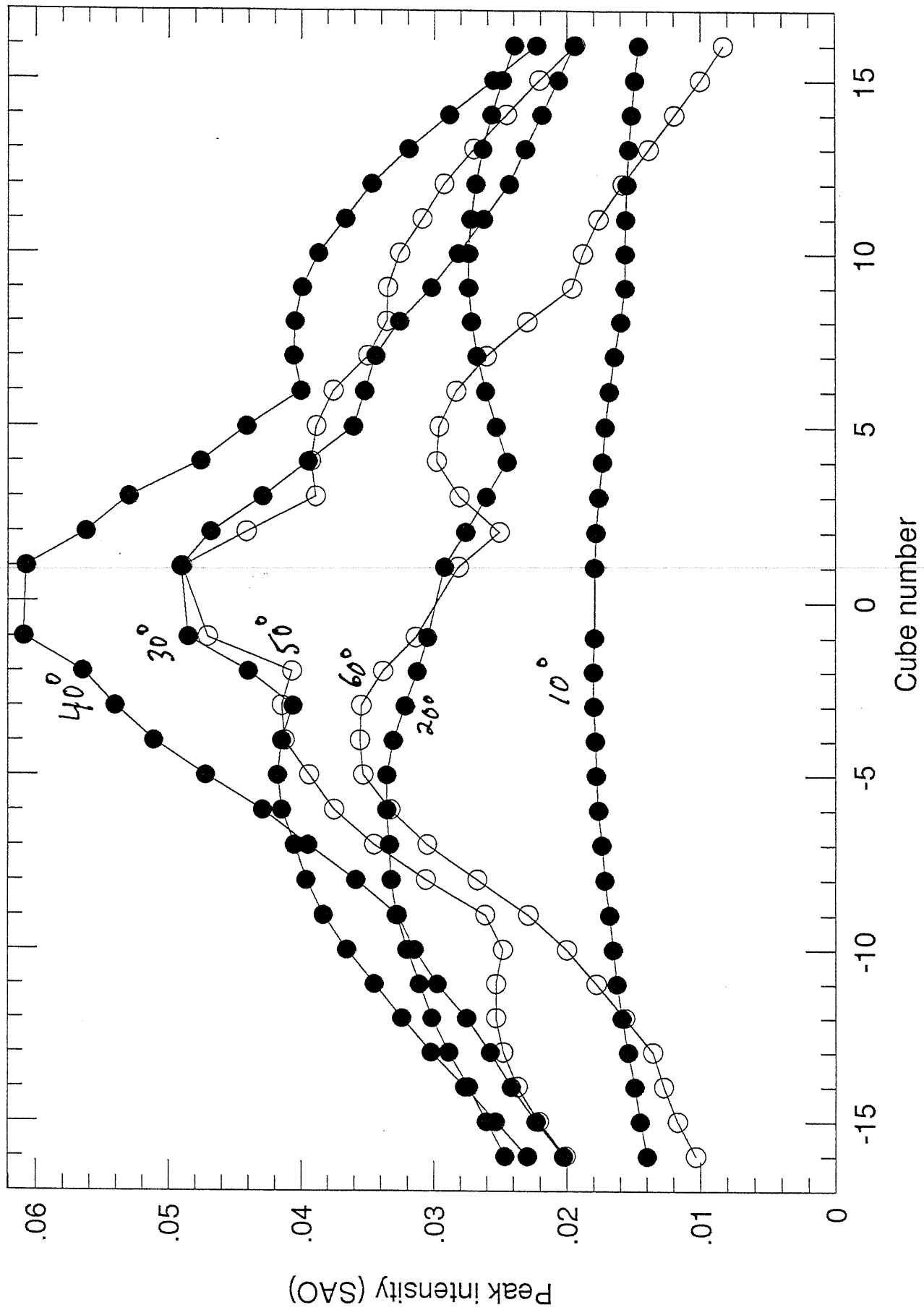


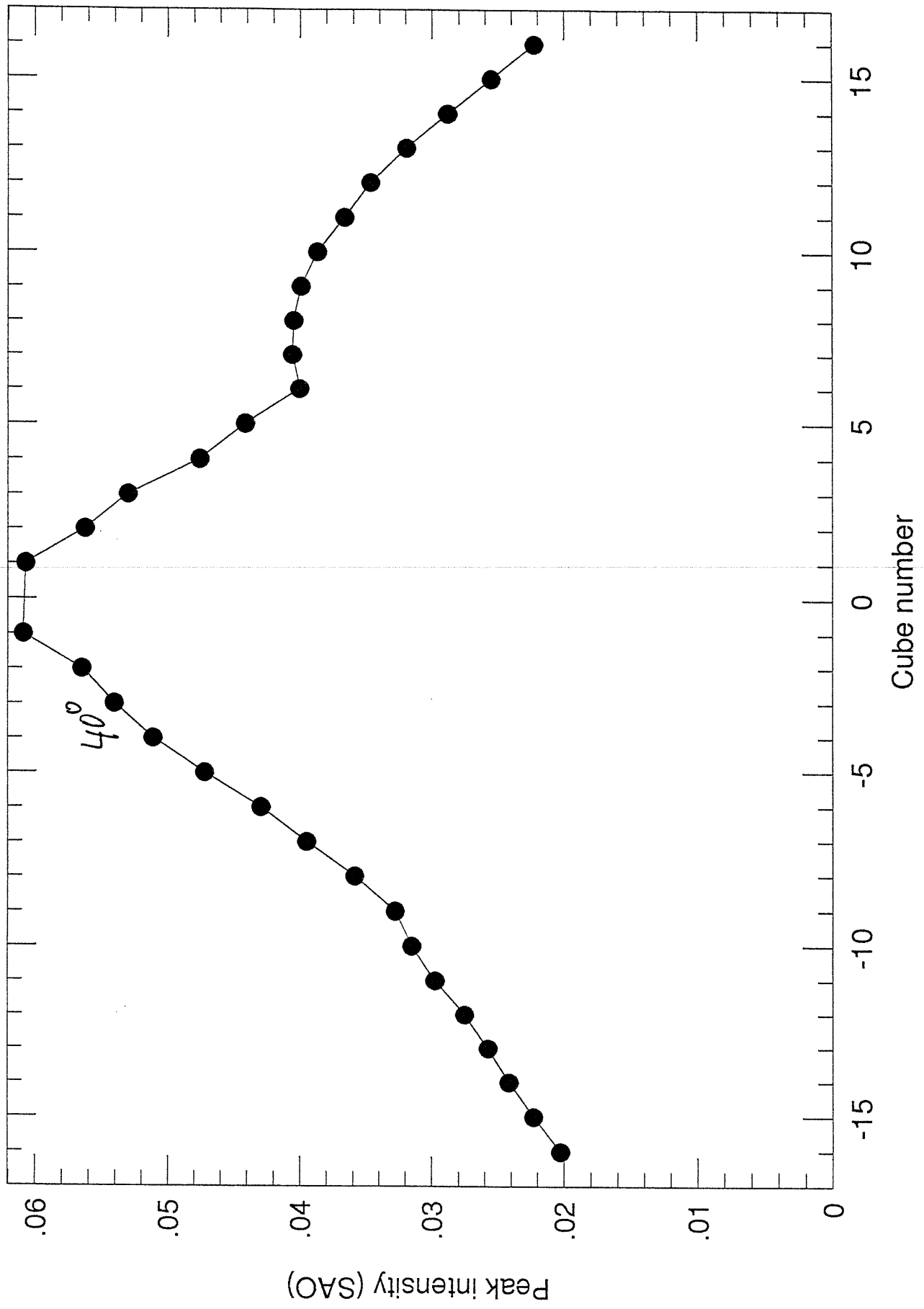


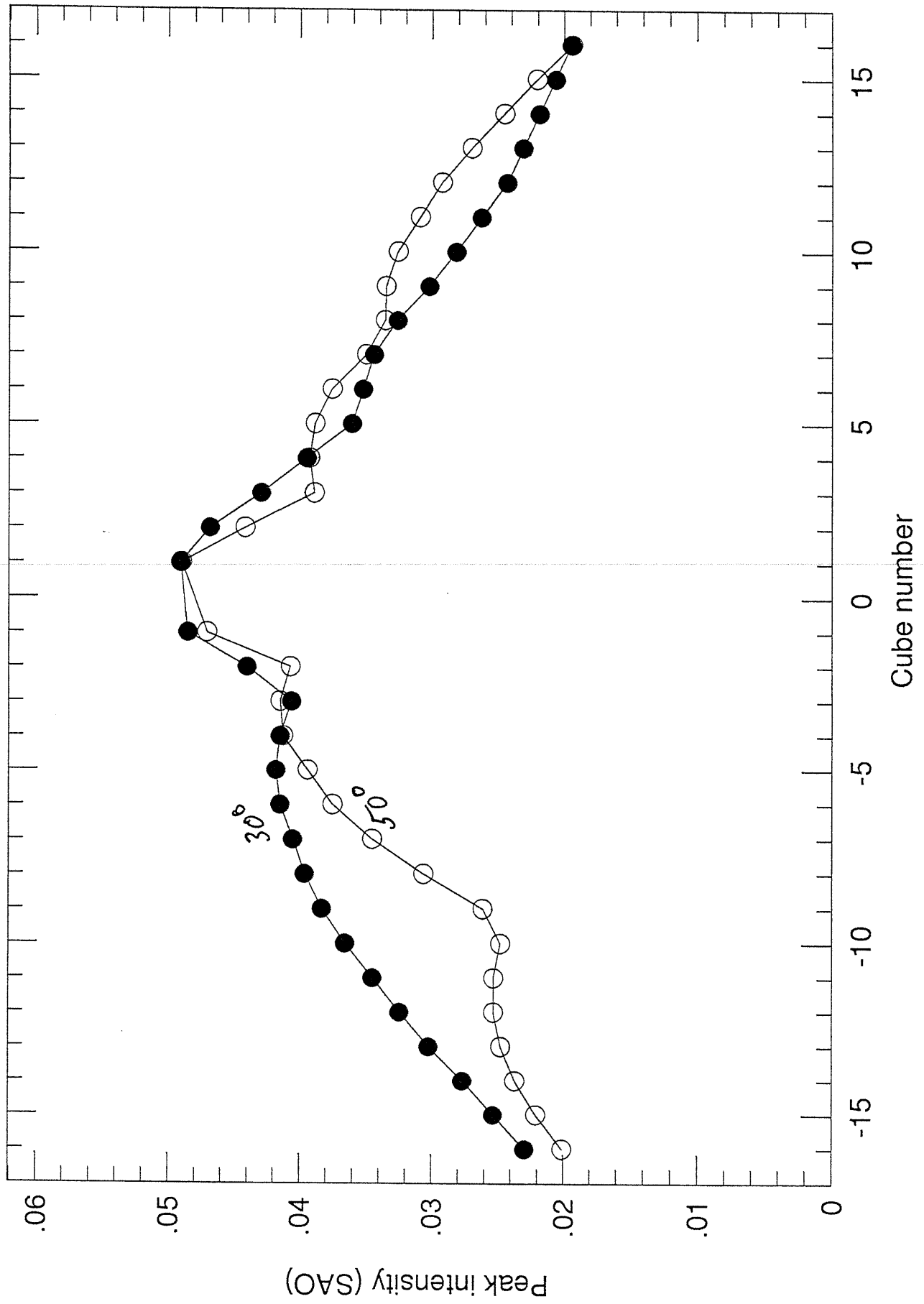


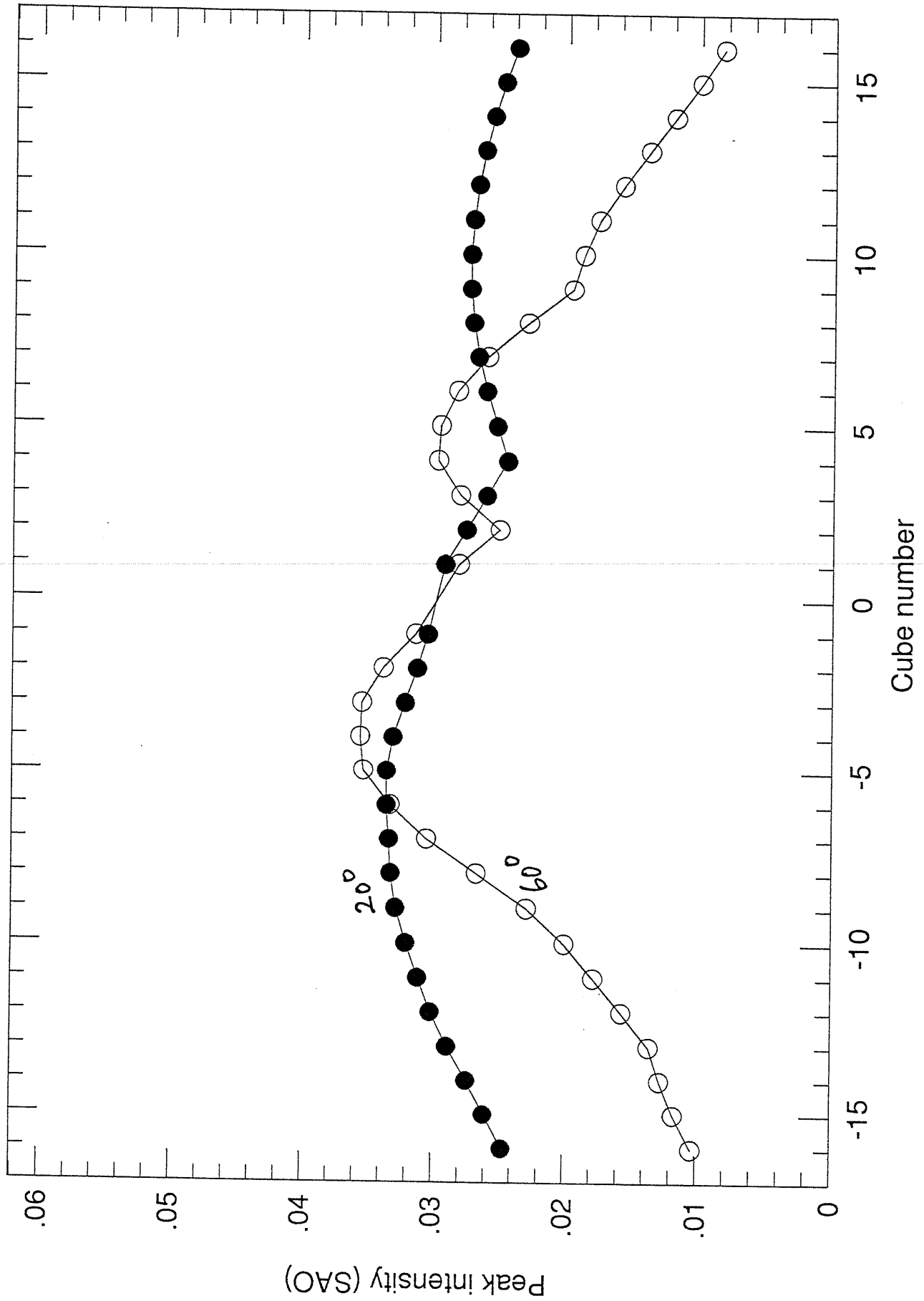


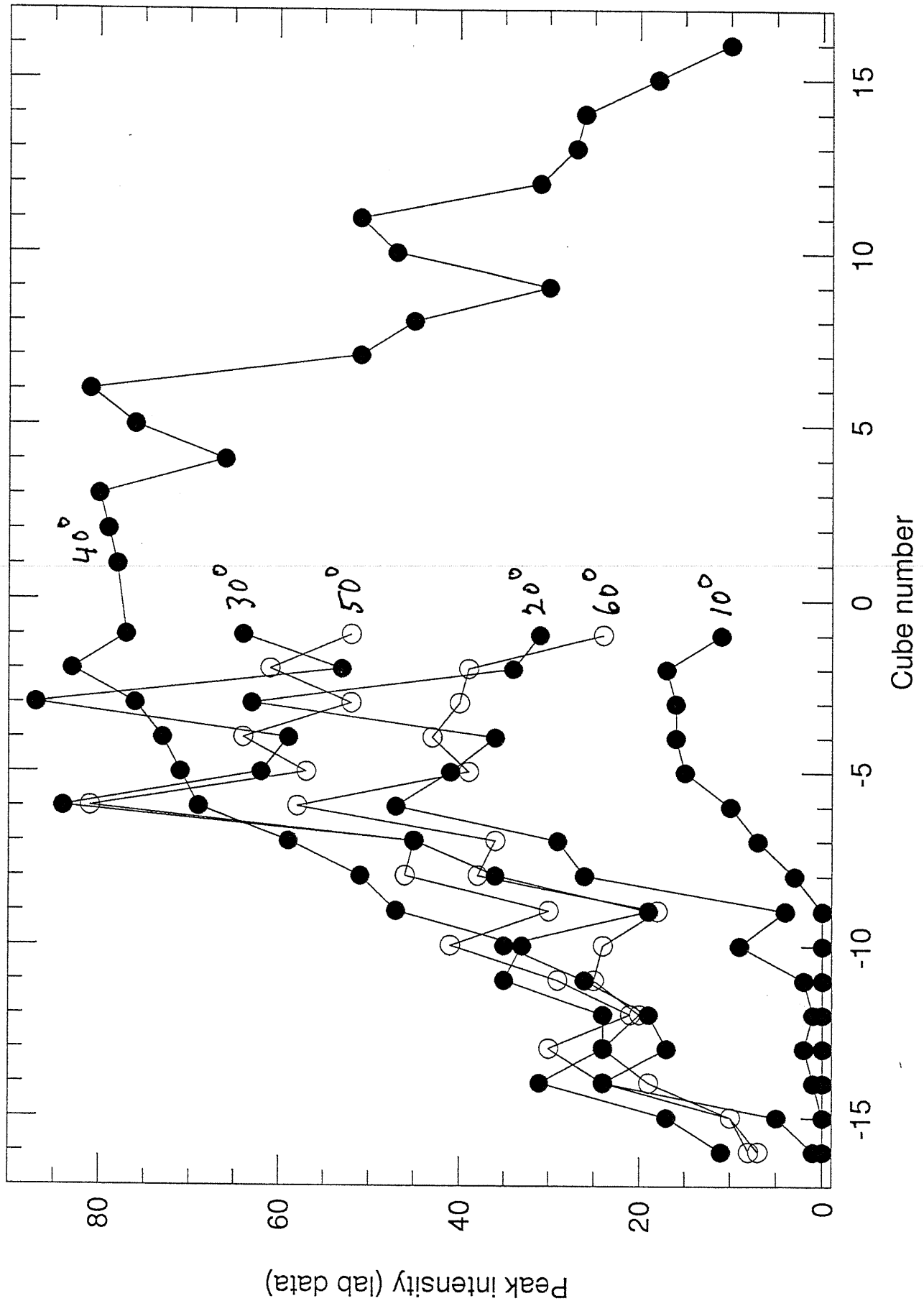


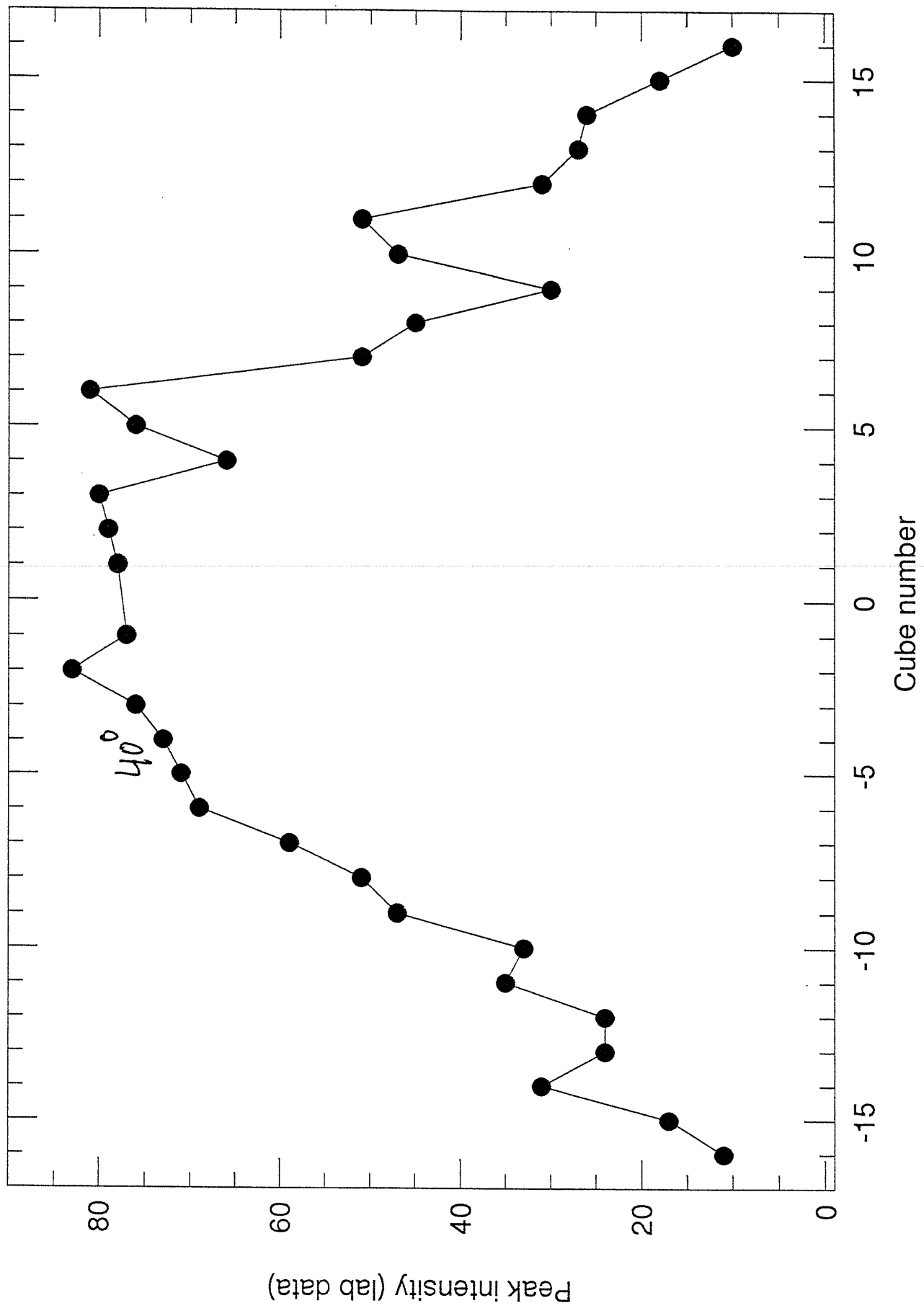


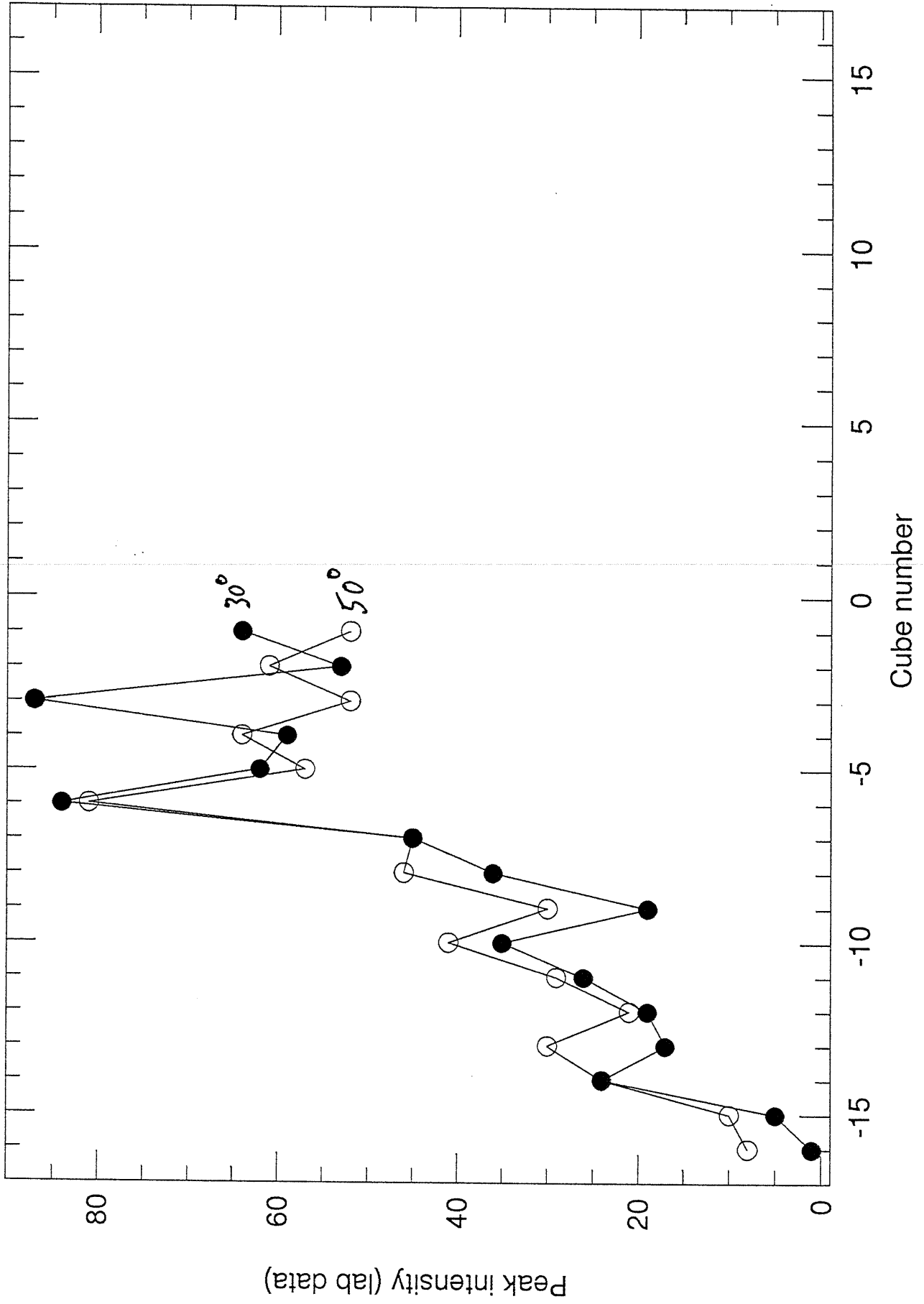


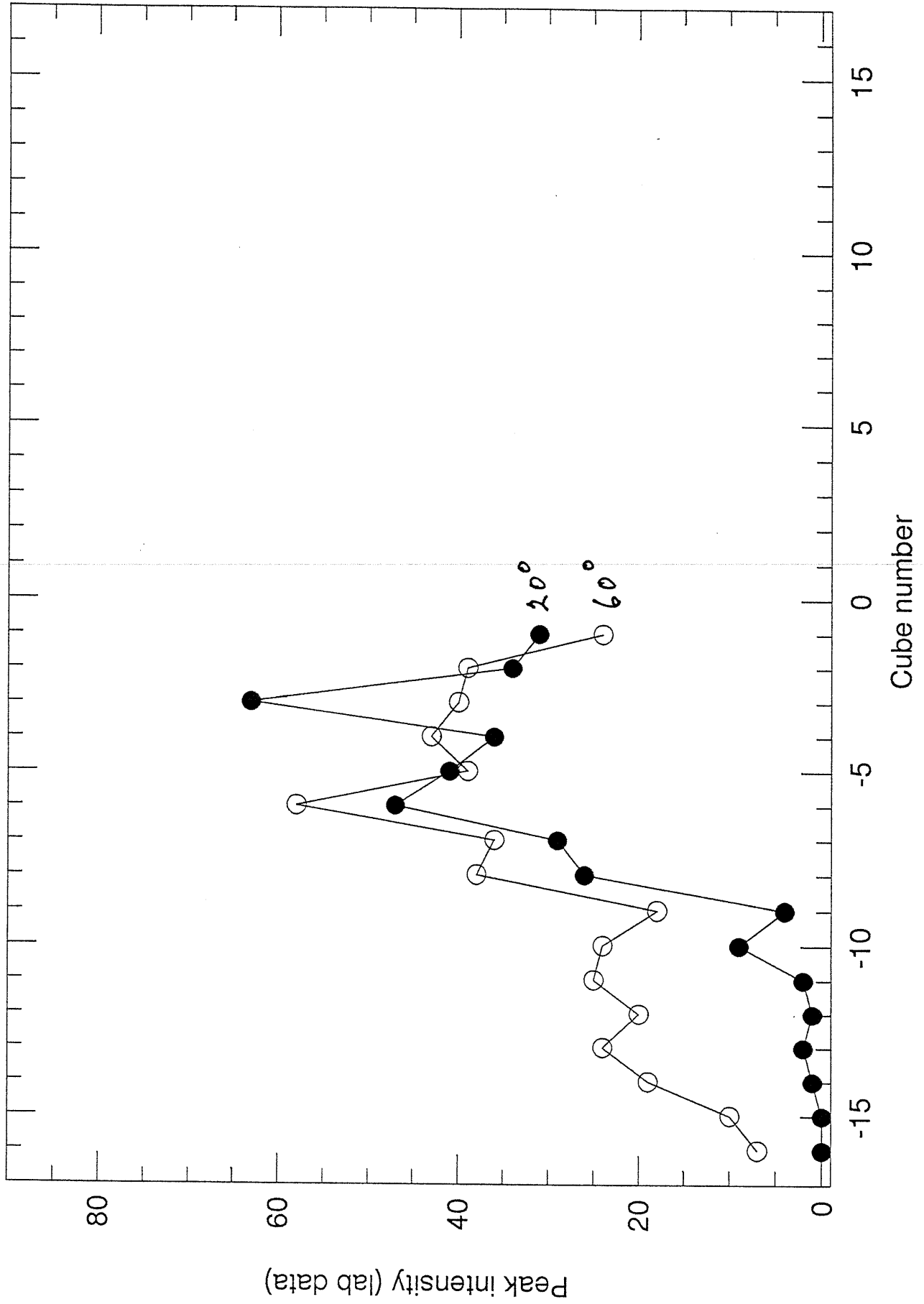












ALL THE ".MAT" FILES ARE DATA FILES. ANY FILES WHICH BEGIN WITH A "T" ARE TOPEX FILES. THE OTHER FILES ARE MISCELLANEOUS LASER CALIBRATION SHOTS OR OTHER TEST SHOTS.

THE FILE NAMES CONSIST OF 9 CHARACTERS:

- 1: "T" FOR TOPEX
- 2: "E" OR "X"
 - "E" EXPERIMENTAL
 - "X" ?

3-4: "01" THRU "17" SATELLITE POSITION WHICH ARE LISTED BELOW

"1"	THEPOS(1)/40.0/,	PHIPOS(1)/33.75/
"2"	THEPOS(2)/40.0/,	PHIPOS(2)/11.25/
"3"	THEPOS(3)/40.0/,	PHIPOS(3)/348.75/
"4"	THEPOS(4)/40.0/,	PHIPOS(4)/326.25/
"5"	THEPOS(5)/0.0/,	PHIPOS(5)/33.75/
"6"	THEPOS(6)/10.0/,	PHIPOS(6)/33.75/
"7"	THEPOS(7)/20.0/,	PHIPOS(7)/33.75/
"8"	THEPOS(8)/30.0/,	PHIPOS(8)/33.75/
"9"	THEPOS(9)/50.0/,	PHIPOS(9)/33.75/
"10"	THEPOS(10)/60.0/,	PHIPOS(10)/33.75/
"11"	THEPOS(11)/0.0/,	PHIPOS(11)/11.25/
"12"	THEPOS(12)/10.0/,	PHIPOS(12)/11.25/
"13"	THEPOS(13)/20.0/,	PHIPOS(13)/11.25/
"14"	THEPOS(14)/30.0/,	PHIPOS(14)/11.25/
"15"	THEPOS(15)/50.0/,	PHIPOS(15)/11.25/
"16"	THEPOS(16)/60.0/,	PHIPOS(16)/11.25/
"17"	THEPOS(17)/40.0/,	PHIPOS(17)/0.0/

5: "1" OR "2" WAVELENGTH

- "1" = .4880
- "2" = .6328

6: "1" THRU "4" POLARIZATION

- "1" = UNPOLAR
- "2" = VERTICAL
- "3" = HORIZONT
- "4" = CIRCULAR

7-9: "1" THRU "192" CUBE CORNER NUMBER

****NOTE****

NEGATIVE CUBE CORNERS ARE FULL TRAY SHOTS

"-1" THRU "-17"

Tray Layout and Cube Nomenclature

	Row 1	1 - 64	4 Cubes/Tray	
	Row 2	65 - 192	8 Cubes/Tray	
Tray 1	1 - 4 65 - 72	Tray 9	33 - 36 129 - 136	Tray 16 61 - 64 185 - 192
Tray 2	5 - 8 73 - 80	Tray 10	37 - 40 137 - 144	Tray 17 Spare S1 - S4 S5 - S12
Tray 4	9 - 12 81 - 88	Tray 11	41 - 44 145 - 152	
Tray 5	13 - 16 89 - 96	Tray 12	45 - 48 153 - 160	
Tray 6	17 - 20 97 - 104	Tray 13	49 - 52 161 - 168	
Tray 7	25 - 28 113 - 120	Tray 14	53 - 56 169 - 176	
Tray 8	29 - 32 121 - 128	Tray 15	57 - 60 177 - 184	

LEFT SIDE

Theoretical

357	358	359	360	361	362	363	364
<u>213</u>	<u>214</u>	<u>215</u>	<u>216</u>	<u>217</u>	<u>218</u>	<u>219</u>	<u>220</u>
221	222	223	224	225	226	227	228

Experimental

001	002	003	004	001	002	003	004
<u>065</u>	<u>066</u>	<u>067</u>	<u>068</u>	<u>069</u>	<u>070</u>	<u>071</u>	<u>072</u>
065	066	067	068	069	070	071	072

RIGHT SIDE

Theoretical

301	302	303	304	305	306	307	308
<u>101</u>	<u>102</u>	<u>103</u>	<u>104</u>	<u>105</u>	<u>106</u>	<u>107</u>	<u>108</u>
109	110	111	112	113	114	115	116

Experimental

001	002	003	004	005	006	007	008
<u>065</u>	<u>066</u>	<u>067</u>	<u>068</u>	<u>069</u>	<u>070</u>	<u>071</u>	<u>072</u>
065	066	067	068	069	070	071	072

Expanded 40 degree plots

LEFT SIDE

Theoretical

357	358	359	360	361	362	363	364
<u>213</u>	<u>214</u>	<u>215</u>	<u>216</u>	<u>217</u>	<u>218</u>	<u>219</u>	<u>220</u>
221	222	223	224	225	226	227	228

Experimental

001	002	003	004	001	002	003	004
<u>065</u>	<u>066</u>	<u>067</u>	<u>068</u>	<u>069</u>	<u>070</u>	<u>071</u>	<u>072</u>
065	066	067	068	069	070	071	072

LEFT SIDE

Theoretical

357	358	359	360	361	362	363	364
<u>213</u>	<u>214</u>	<u>215</u>	<u>216</u>	<u>217</u>	<u>218</u>	<u>219</u>	<u>220</u>
221	222	223	224	225	226	227	228

Experimental

001	002	003	004	001	002	003	004
<u>065</u>	<u>066</u>	<u>067</u>	<u>068</u>	<u>069</u>	<u>070</u>	<u>071</u>	<u>072</u>
065	066	067	068	069	070	071	072

RIGHT SIDE

Theoretical

301	302	303	304	305	306	307	308
<u>101</u>	<u>102</u>	<u>103</u>	<u>104</u>	<u>105</u>	<u>106</u>	<u>107</u>	<u>108</u>
109	110	111	112	113	114	115	116

Experimental

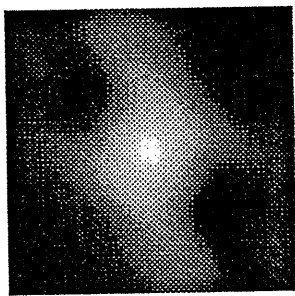
001	002	003	004	005	006	007	008
<u>065</u>	<u>066</u>	<u>067</u>	<u>068</u>	<u>069</u>	<u>070</u>	<u>071</u>	<u>072</u>
065	066	067	068	069	070	071	072

Theoretical calculations
for 00 degrees

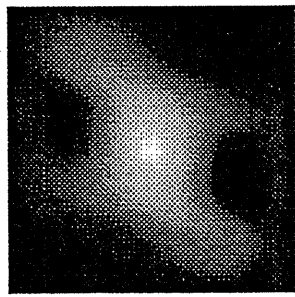
sao hexagonal, 6328, 80X80 microradians
orientations -90, +90

pete circular, 50X50 microradians

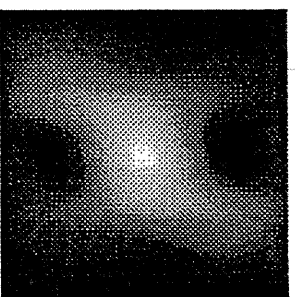
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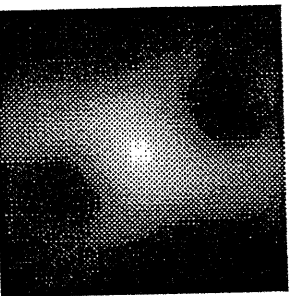
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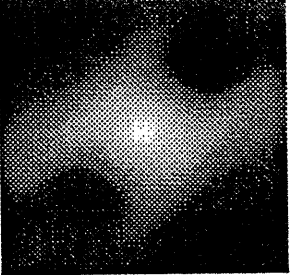
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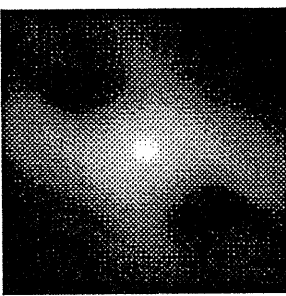
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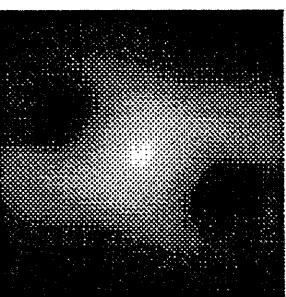
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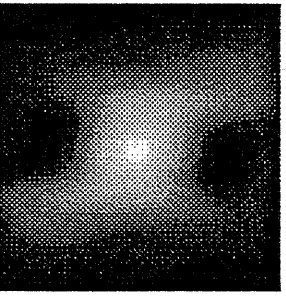
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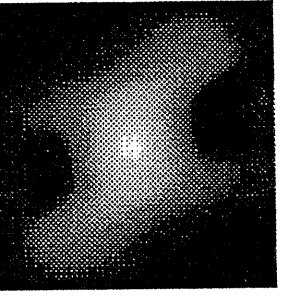
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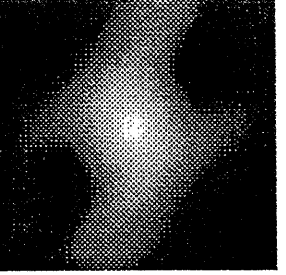
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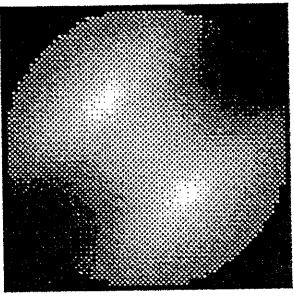
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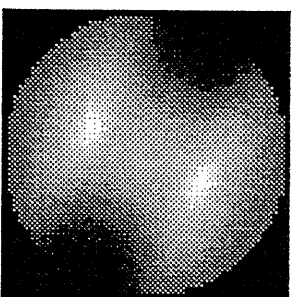
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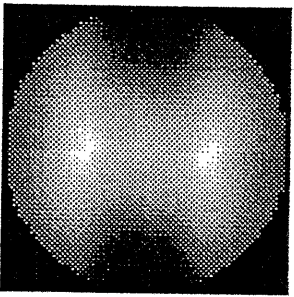
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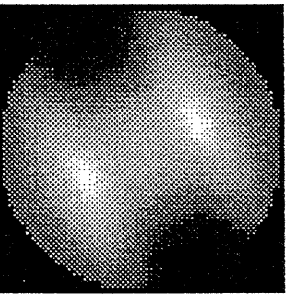
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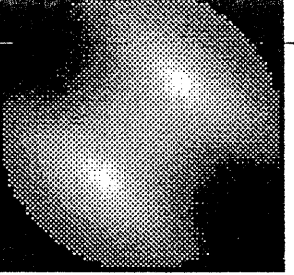
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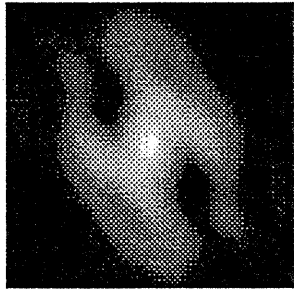


Theoretical calculations
for 10 degrees

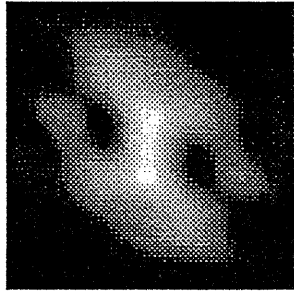
sao hexagonal, 6328, 80X80 microradians
orientations -90, +90

pete circular, 50X50 microradians

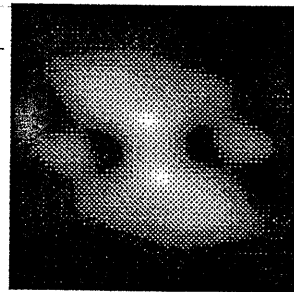
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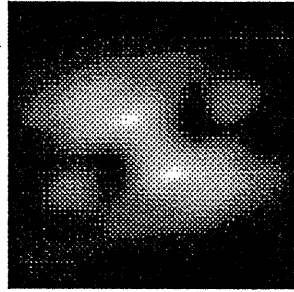
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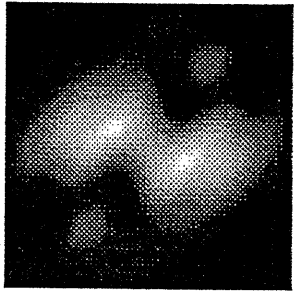
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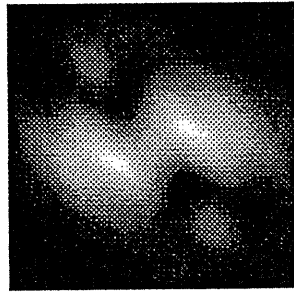
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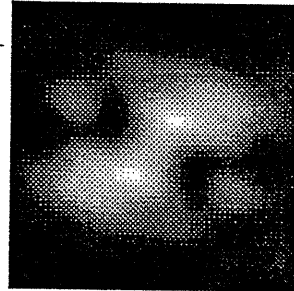
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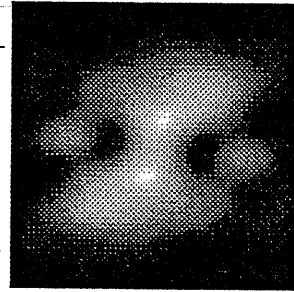
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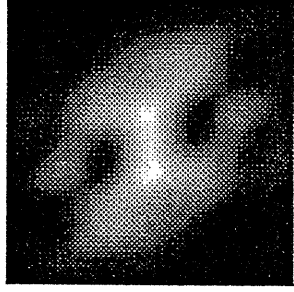
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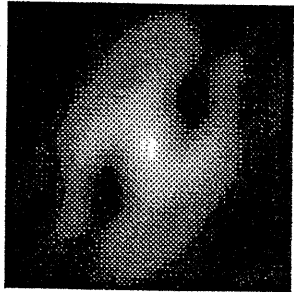
10,+90 sao228.ps



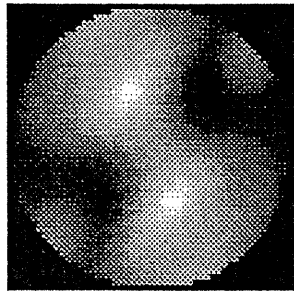
10,+90 sao108.ps



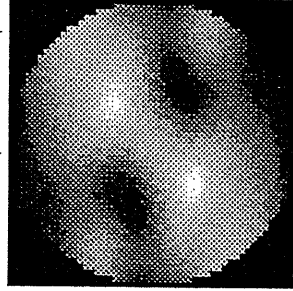
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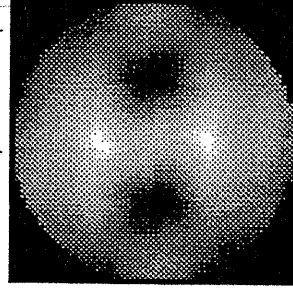
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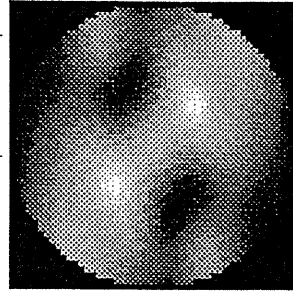
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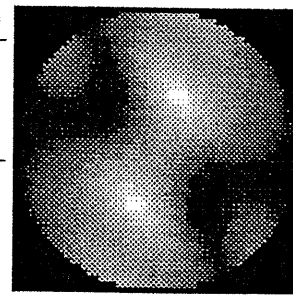
10 pete228.ps



10 pete108.ps



10 pete116.ps

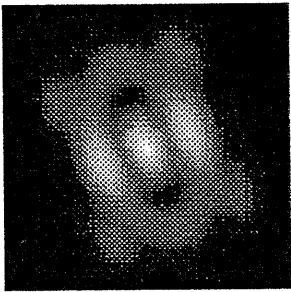


Theoretical calculations
for 20 degrees

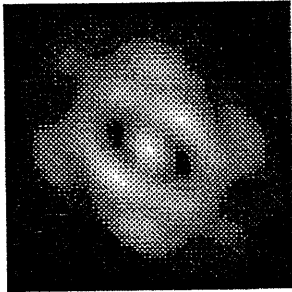
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orientations -90, +90

pete circular, 50X50 microradians

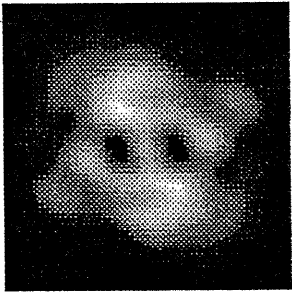
20,-90 sao213.ps



20,-90 sao221.ps



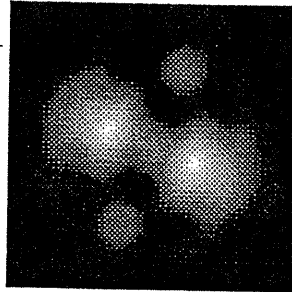
20,-90 sao228.ps



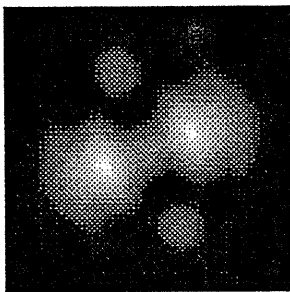
20,-90 sao108.ps



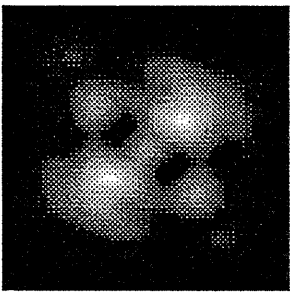
20,-90 sao116.ps



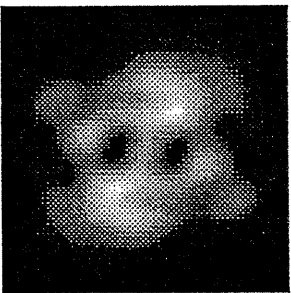
20,+90 sao213.ps



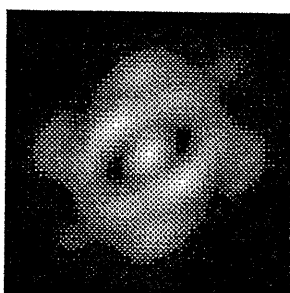
20,+90 sao221.ps



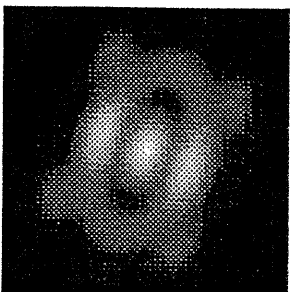
20,+90 sao228.ps



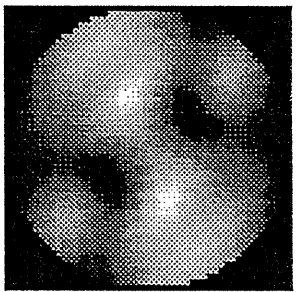
20,+90 sao108.ps



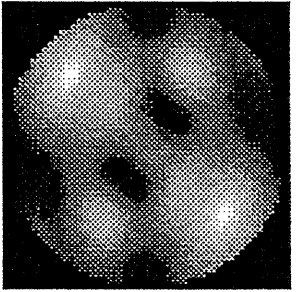
20,+90 sao116.ps



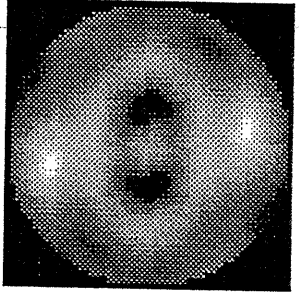
20 pete213.ps



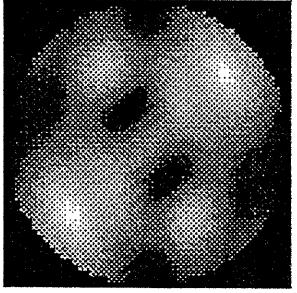
20 pete221.ps



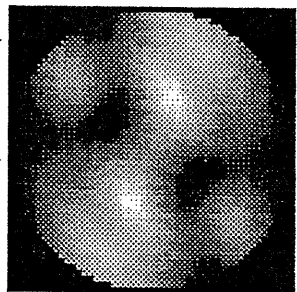
20 pete228.ps



20 pete108.ps



20 pete116.ps

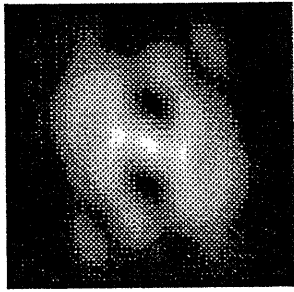


Theoretical calculations
for 30 degrees

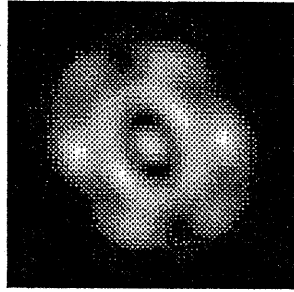
sao hexagonal, 6328, 80X80 microradians
orientations -90, +90

pete circular, 50X50 microradians

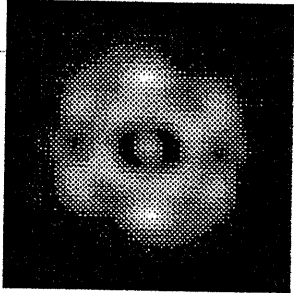
30,-90 sao213.ps



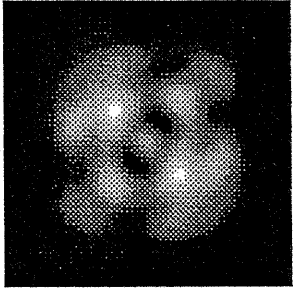
30,-90 sao221.ps



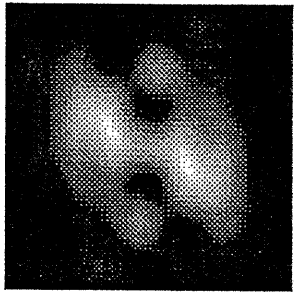
30,-90 sao228.ps



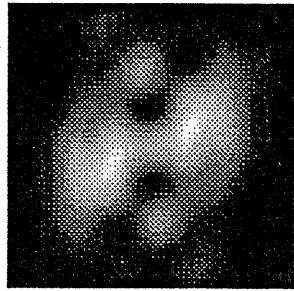
30,-90 sao108.ps



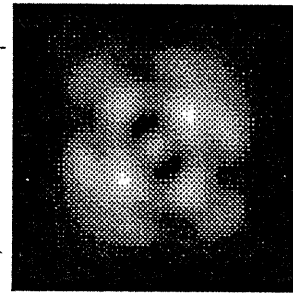
30,-90 sao116.ps



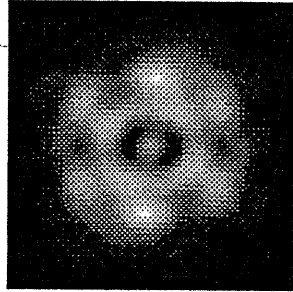
30,+90 sao213.ps



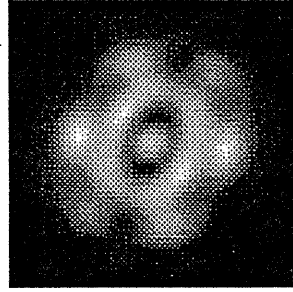
30,+90 sao221.ps



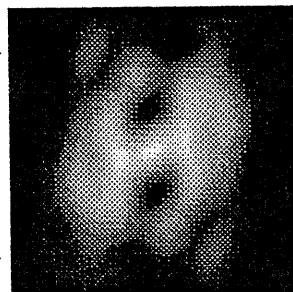
30,+90 sao228.ps



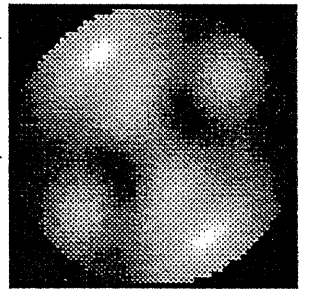
30,+90 sao108.ps



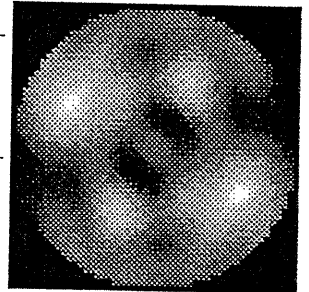
30,+90 sao116.ps



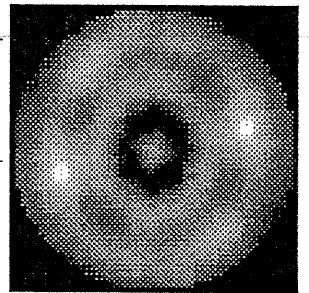
30 pete213.ps



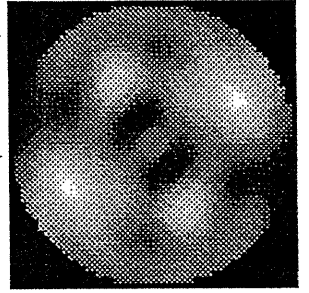
30 pete221.ps



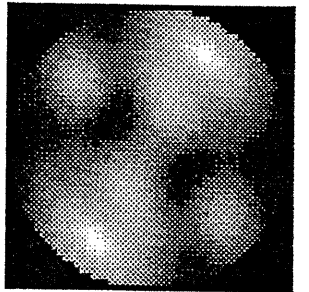
30 pete228.ps



30 pete108.ps



30 pete116.ps

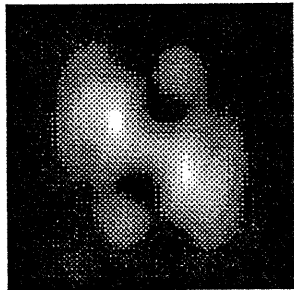


Theoretical calculations
for 40 degrees

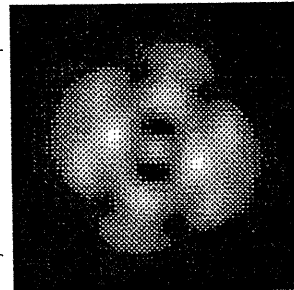
sao hexagonal, 6328, 80X80 microradians
orientations -90, +90

pete circular, 50X50 microradians

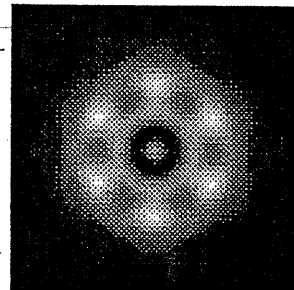
40,-90 sao213.ps



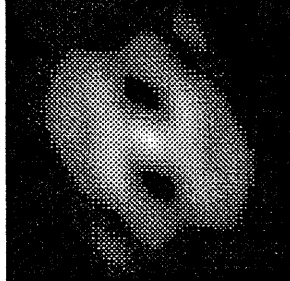
40,-90 sao221.ps



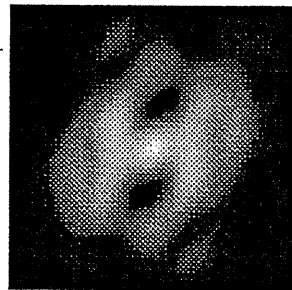
40,-90 sao228.ps



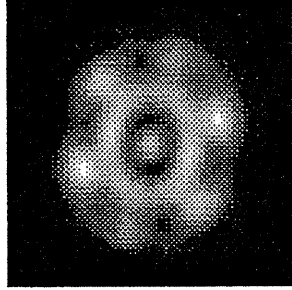
40,-90 sao116.ps



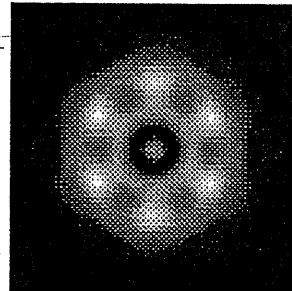
40,+90 sao213.ps



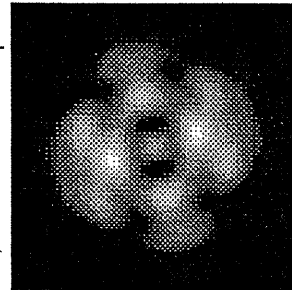
40,+90 sao221.ps



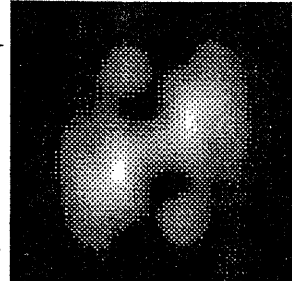
40,+90 sao228.ps



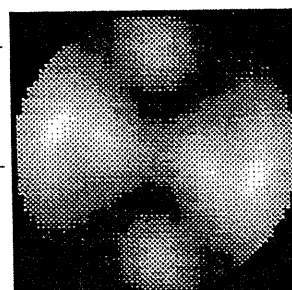
40,+90 sao108.ps



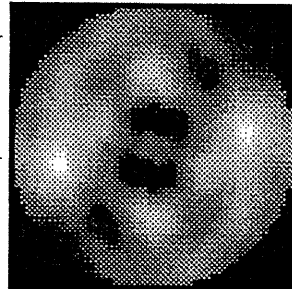
40,+90 sao116.ps



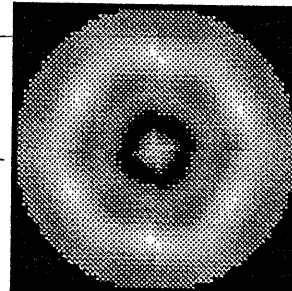
40 pete213.ps



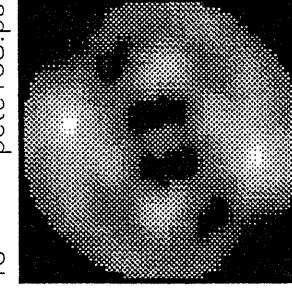
40 pete221.ps



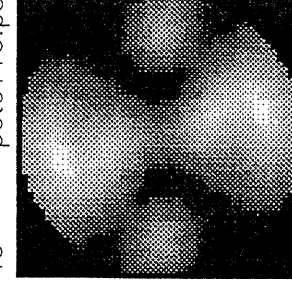
40 pete228.ps



40 pete108.ps



40 pete116.ps

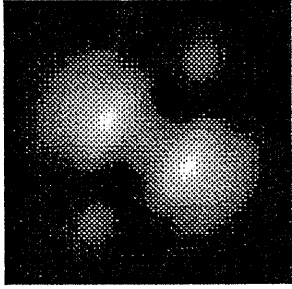


Theoretical calculations
for 50 degrees

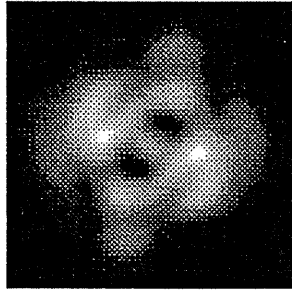
sao hexagonal, 6328, 80X80 microradians
orientations -90, +90

pete circular, 50X50 microradians

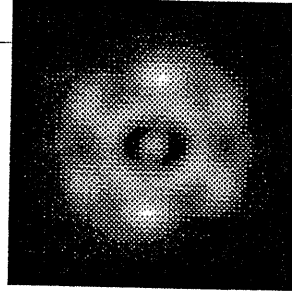
50,-90 sao213.ps



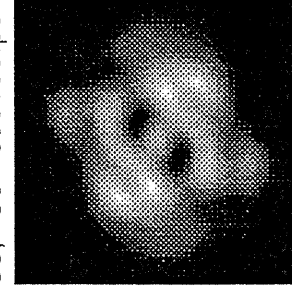
50,-90 sao221.ps



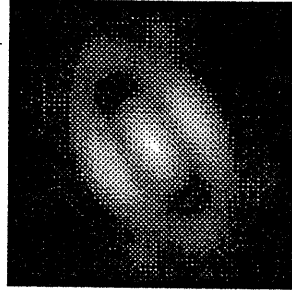
50,-90 sao228.ps



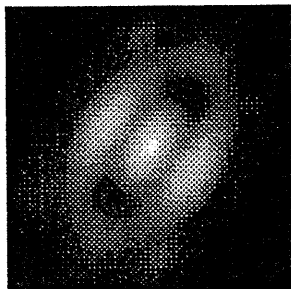
50,-90 sao108.ps



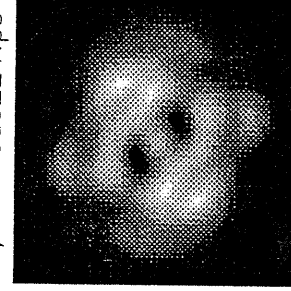
50,-90 sao116.ps



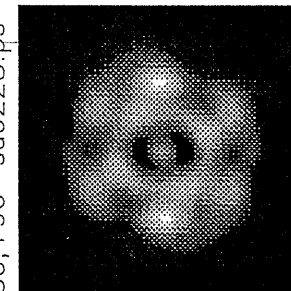
50,+90 sao213.ps



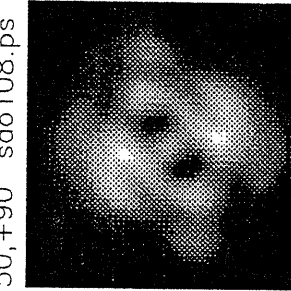
50,+90 sao221.ps



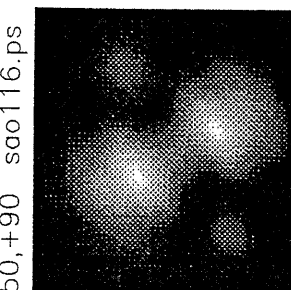
50,+90 sao228.ps



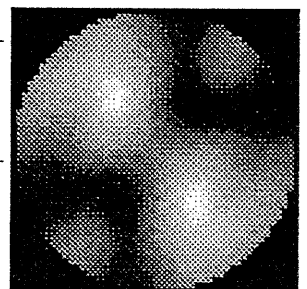
50,+90 sao108.ps



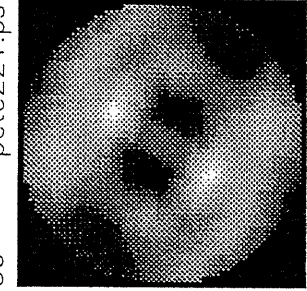
50,+90 sao116.ps



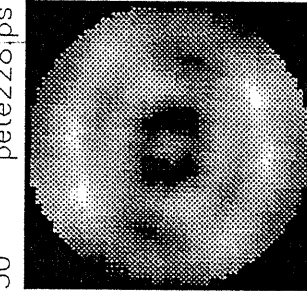
50 pete213.ps



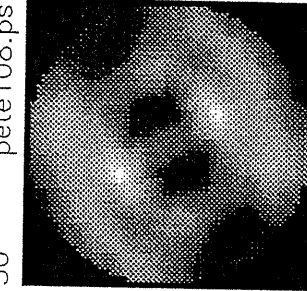
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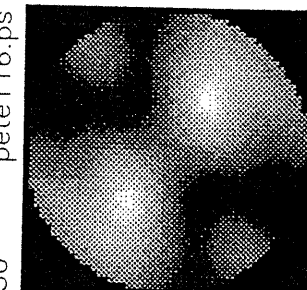
50 pete228.ps



50 pete108.ps



50 pete116.ps

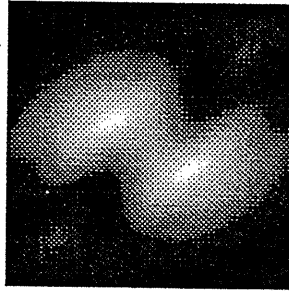


Theoretical calculations
for 60 degrees

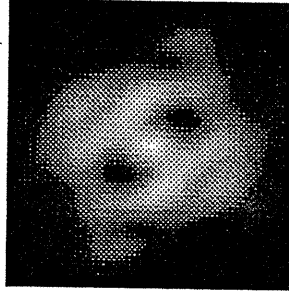
sao hexagonal, 6328, 80X80 microradians
orientations -90, +90

pete circular, 50X50 microradians

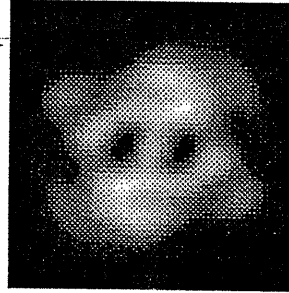
60,-90 sao213.ps



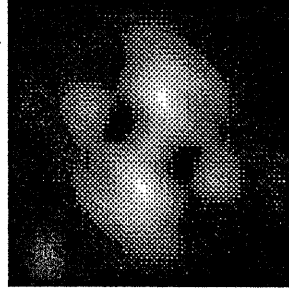
60,-90 sao221.ps



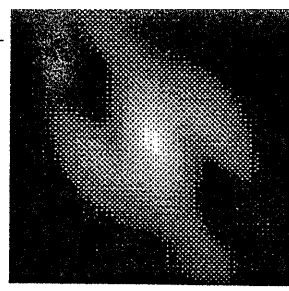
60,-90 sao228.ps



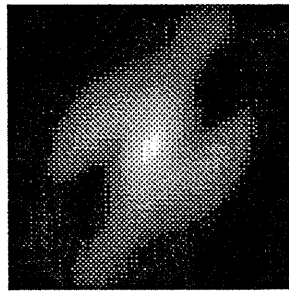
60,-90 sao108.ps



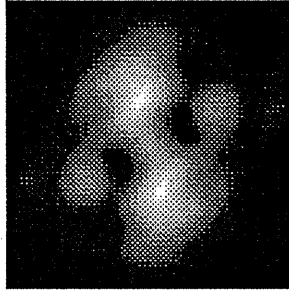
60,-90 sao116.ps



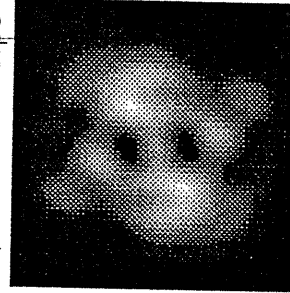
60,+90 sao213.ps



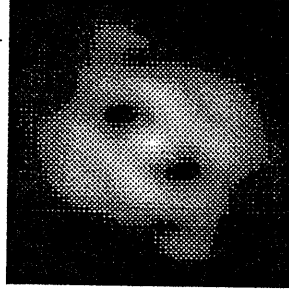
60,+90 sao221.ps



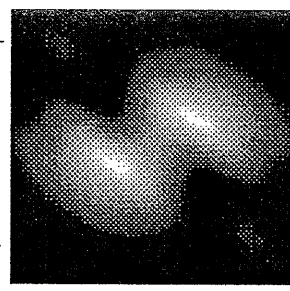
60,+90 sao228.ps



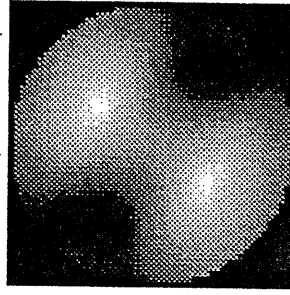
60,+90 sao108.ps



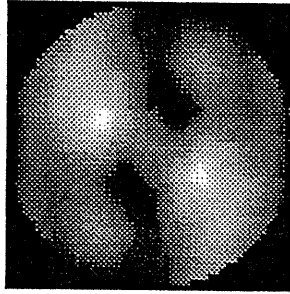
60,+90 sao116.ps



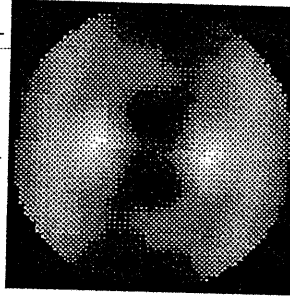
60 pete213.ps



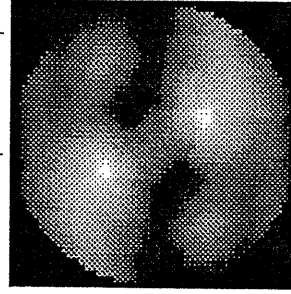
60 pete221.ps



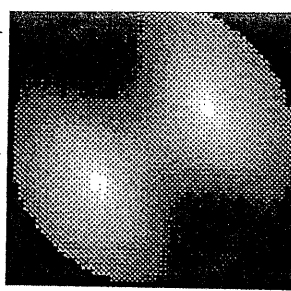
60 pete228.ps



60 pete108.ps



60 pete116.ps

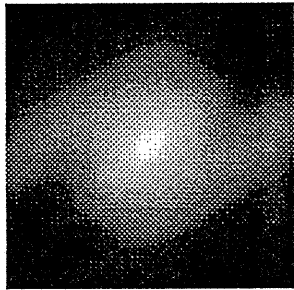


Theoretical calculations
for 70 degrees

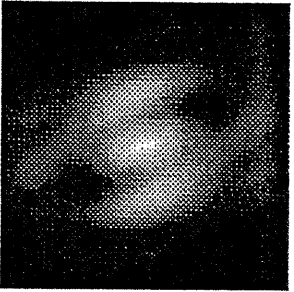
sao

hexagonal, 6328, 80X80 microradians
orientations -90, +90

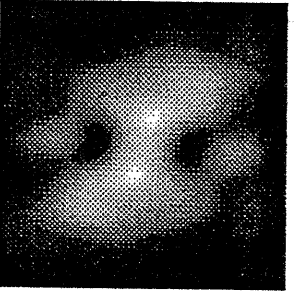
70,-90 sao213.ps



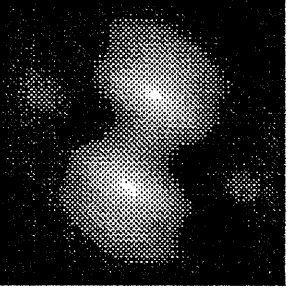
70,-90 sao221.ps



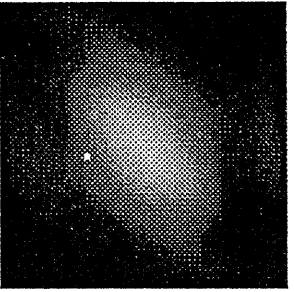
70,-90 sao228.ps



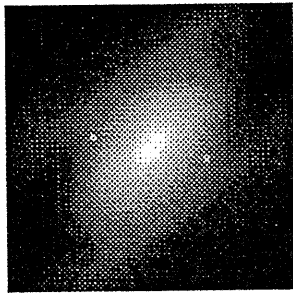
70,-90 sao108.ps



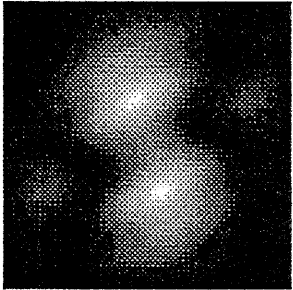
70,-90 sao116.ps



70,+90 sao213.ps



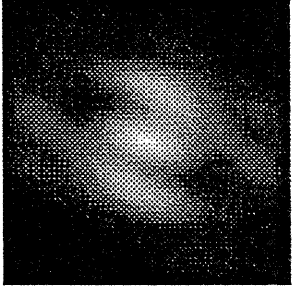
70,+90 sao221.ps



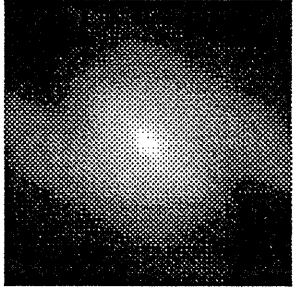
70,+90 sao228.ps



70,+90 sao108.ps

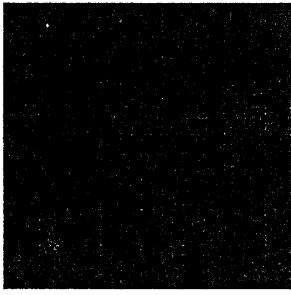


70,+90 sao116.ps

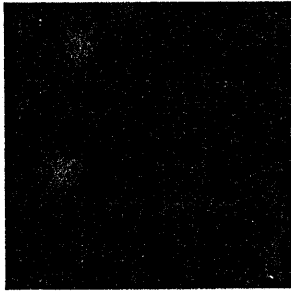


Laboratory data
00 degrees

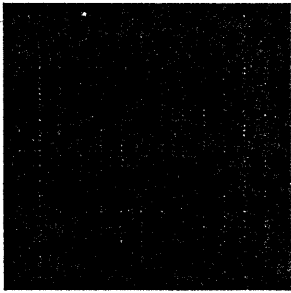
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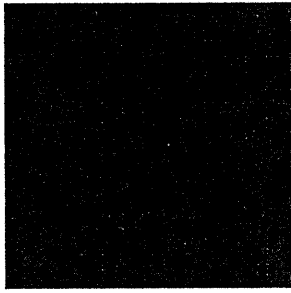
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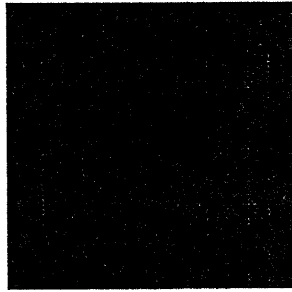
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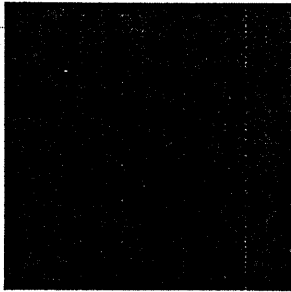
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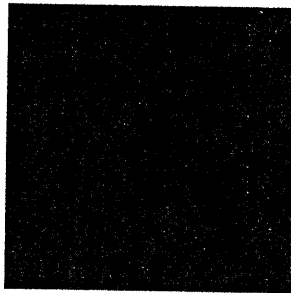
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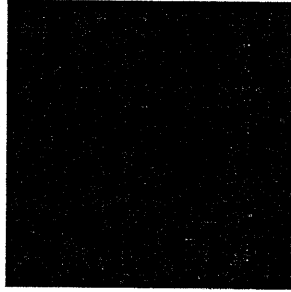
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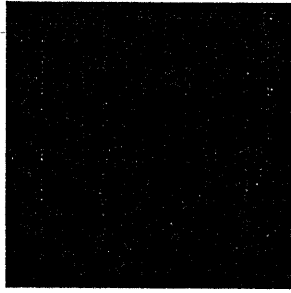
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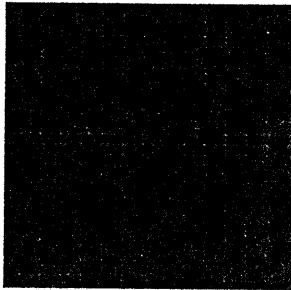


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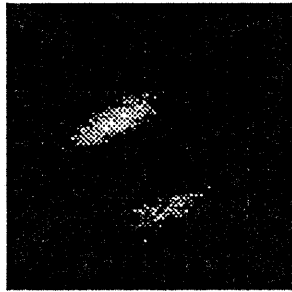


Laboratory data
10 degrees

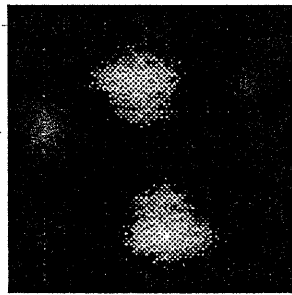
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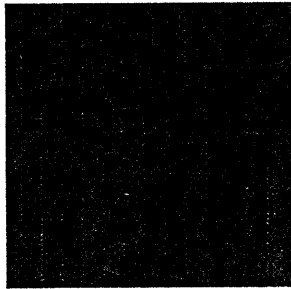
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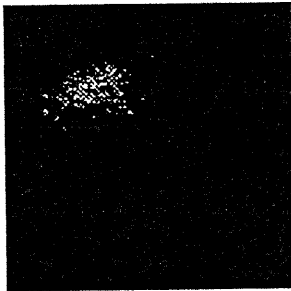
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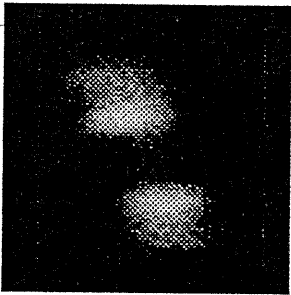
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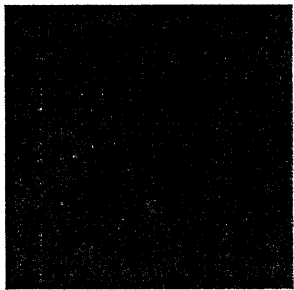
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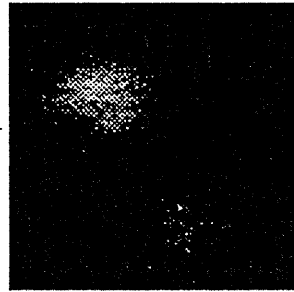
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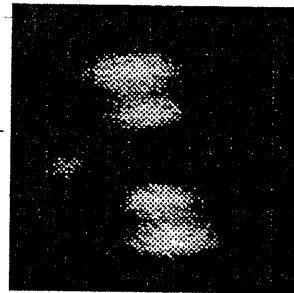
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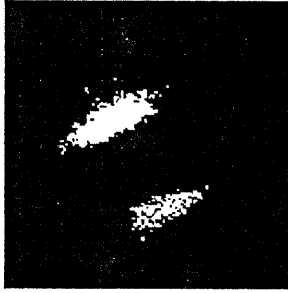


te1221072.ps



Laboratory data
10 degrees

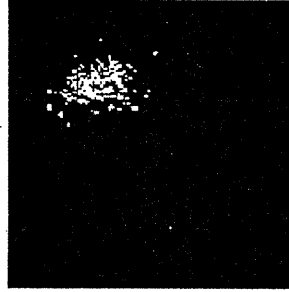
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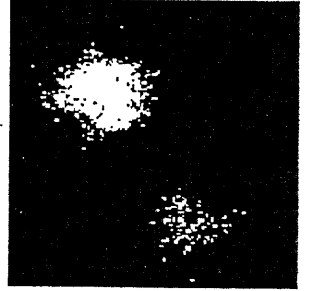
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te1221071.ps



te1221066.ps

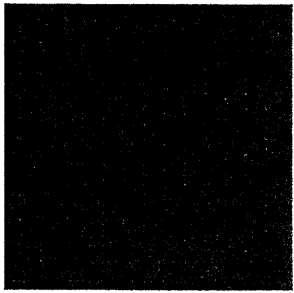


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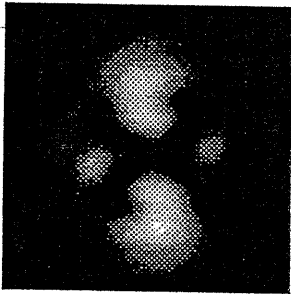


Laboratory data
20 degrees

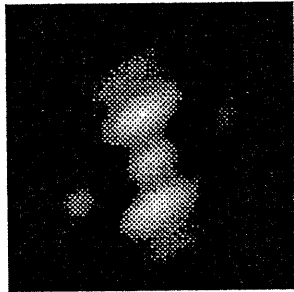
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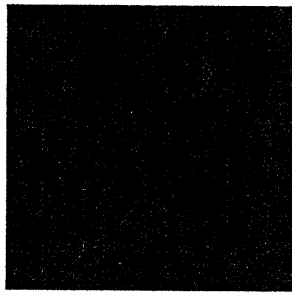
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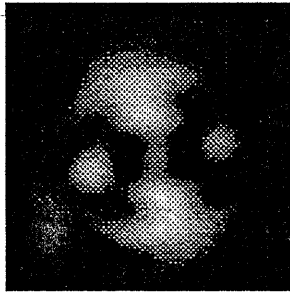
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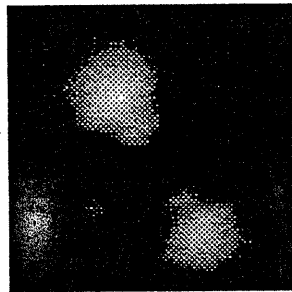
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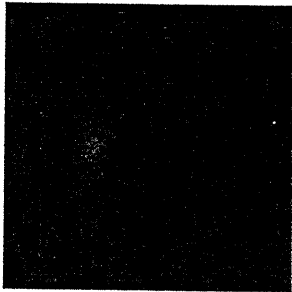
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te1321065.ps



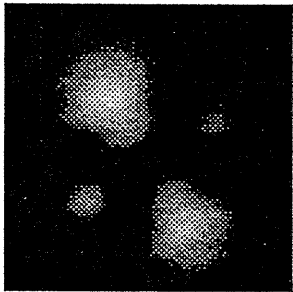
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te1321072.ps



te1321066.ps



Laboratory data
20 degrees

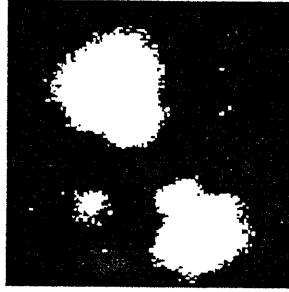
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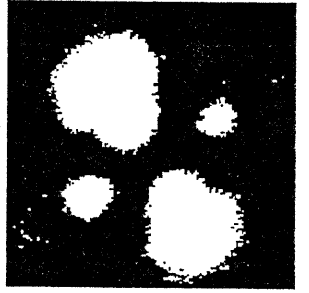
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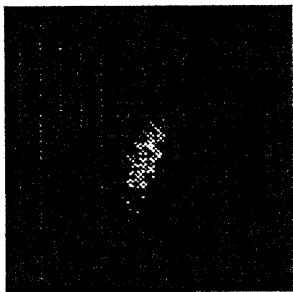


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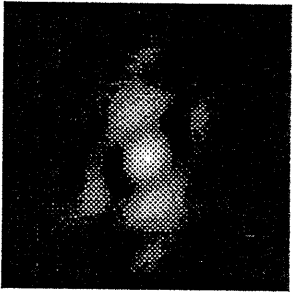


Laboratory data
30 degrees

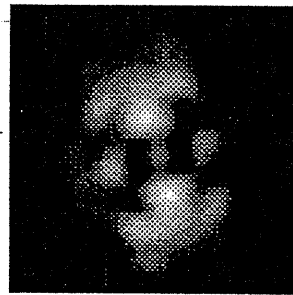
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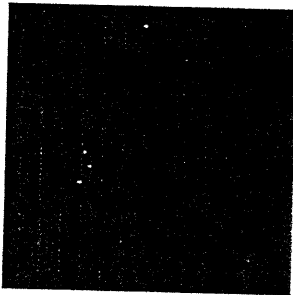
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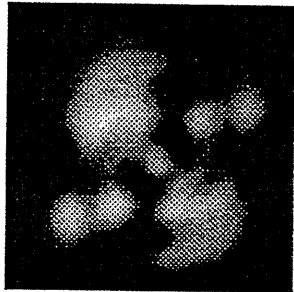
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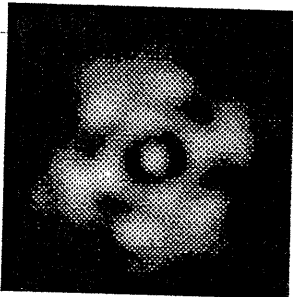
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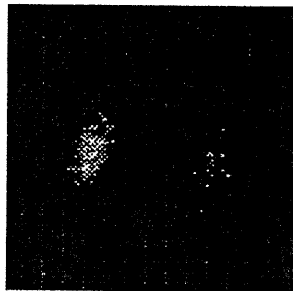
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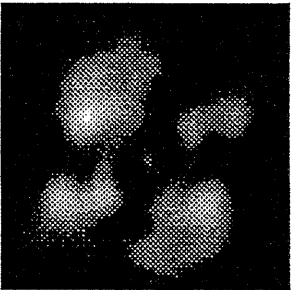
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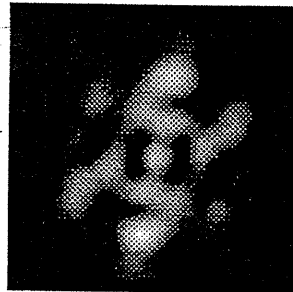
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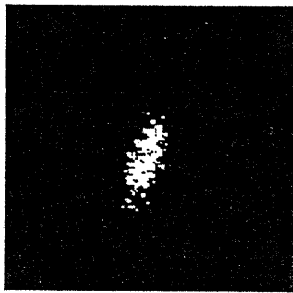


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Laboratory data
30 degrees

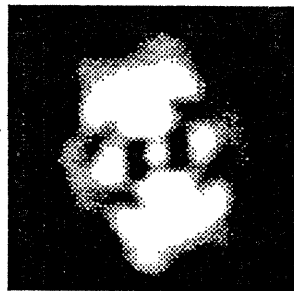
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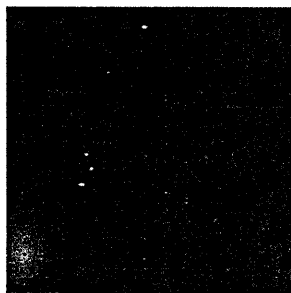
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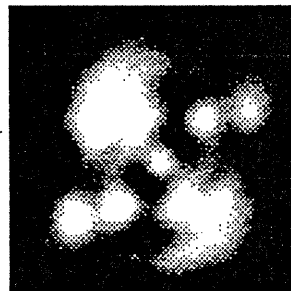
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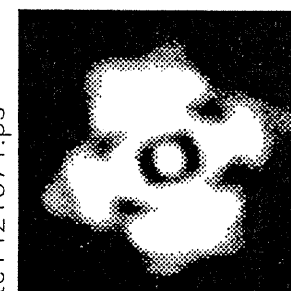
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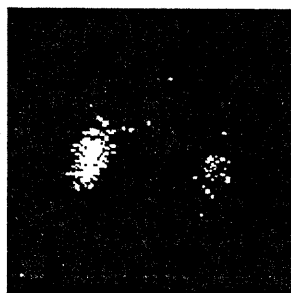
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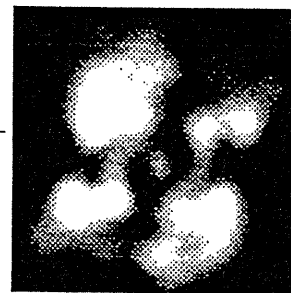
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te0821066.ps



te1421066.ps



te1421072.ps

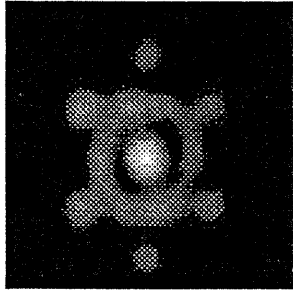


Laboratory data
40 degrees

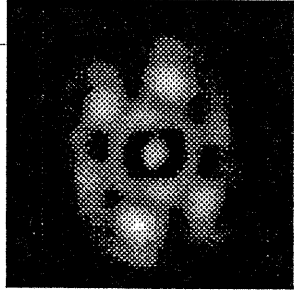
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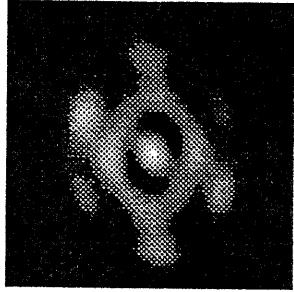
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te0221004.ps



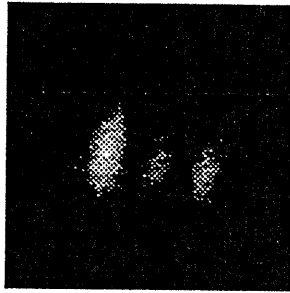
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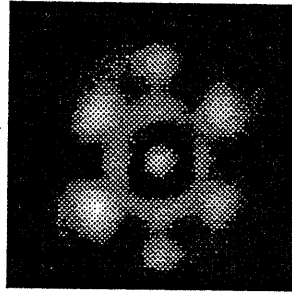
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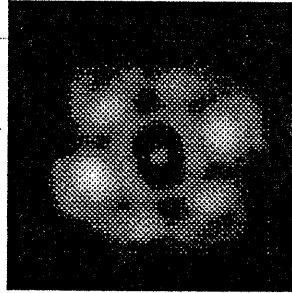
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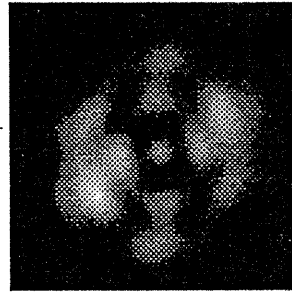
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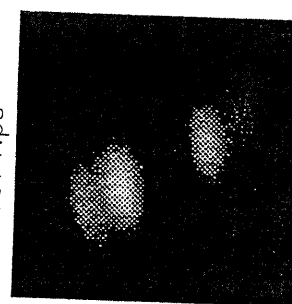
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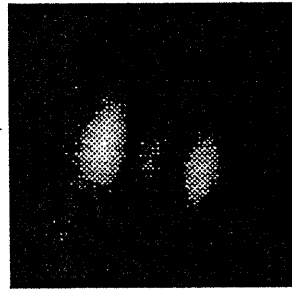
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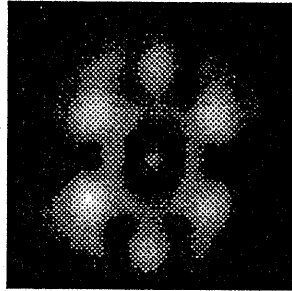
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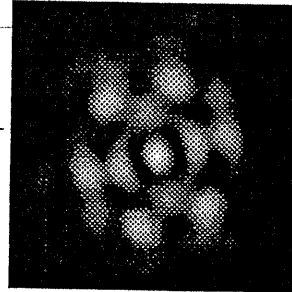
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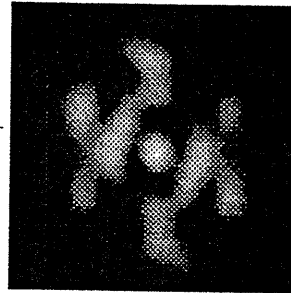
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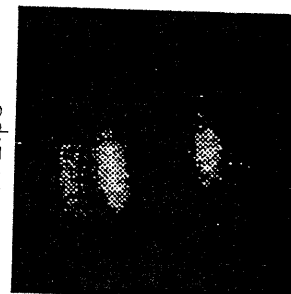
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te0321072.ps



te0421072.ps

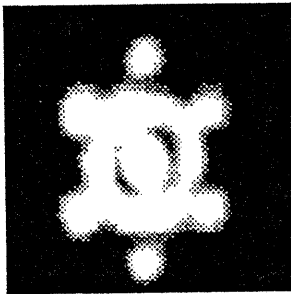


Laboratory data
40 degrees

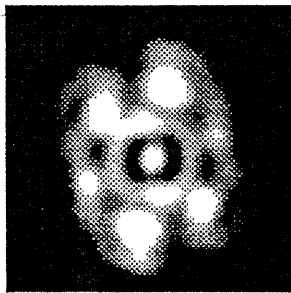
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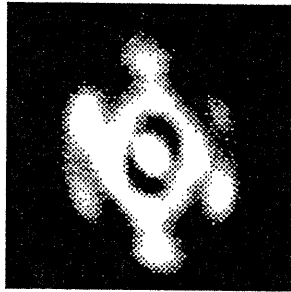
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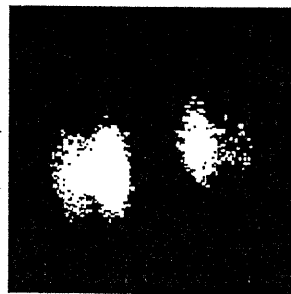
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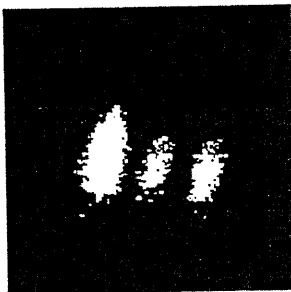
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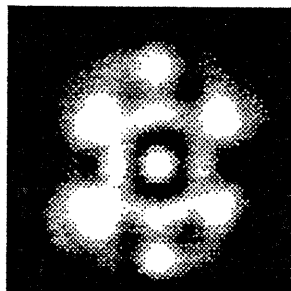
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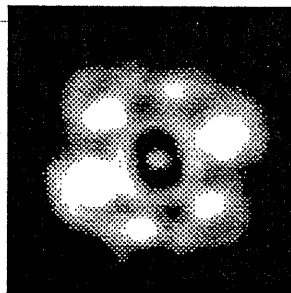
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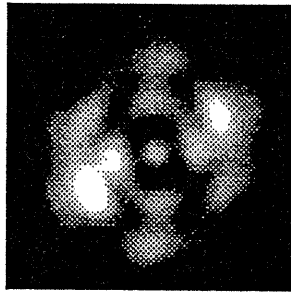
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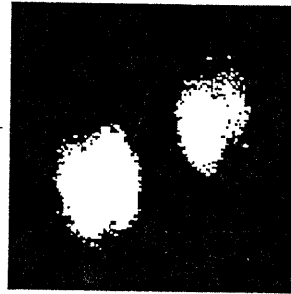
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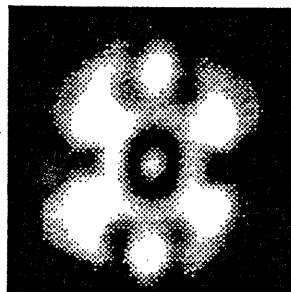
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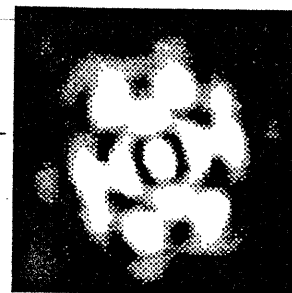
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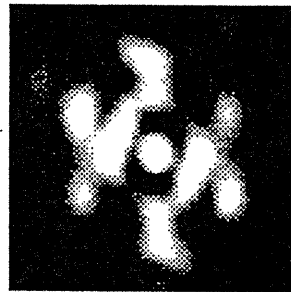
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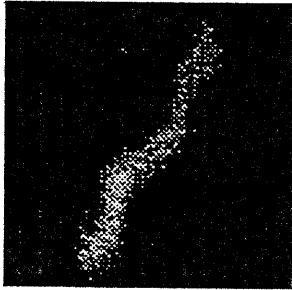


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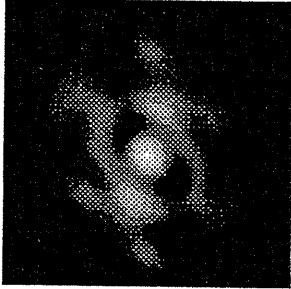


Laboratory data
50 degrees

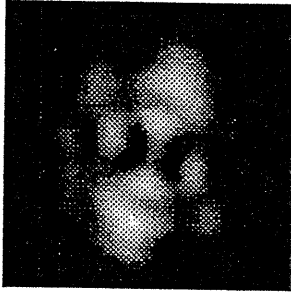
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te1521001.ps



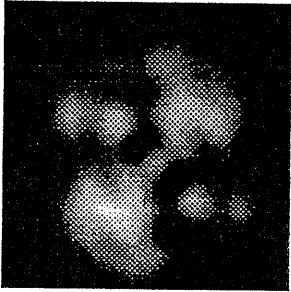
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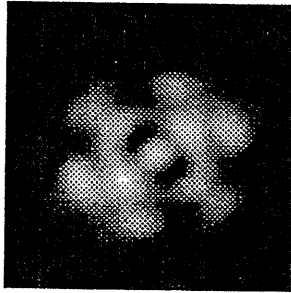
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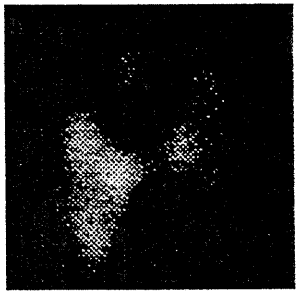
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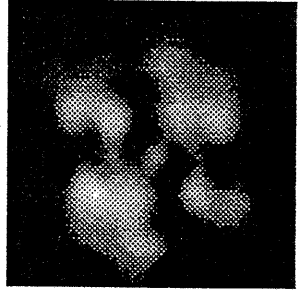
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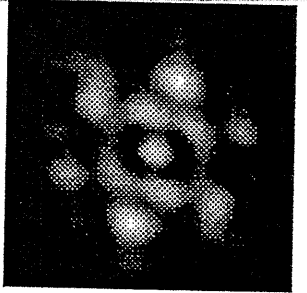
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te1521066.ps

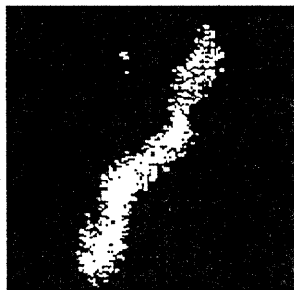


te1521072.ps



Laboratory data
50 degrees

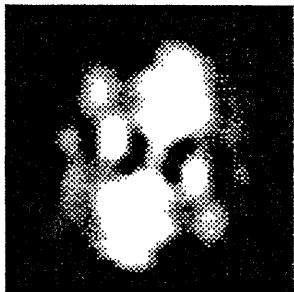
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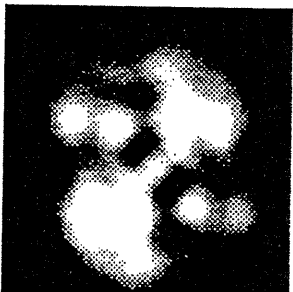
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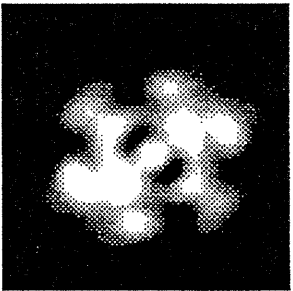
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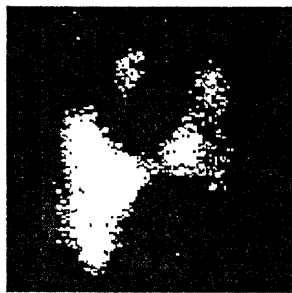
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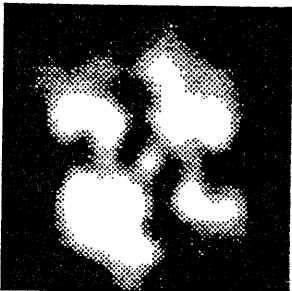
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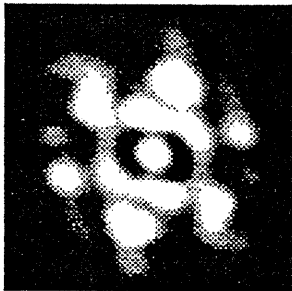
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te1521066.ps

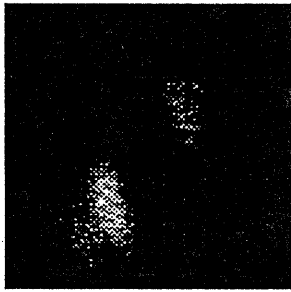


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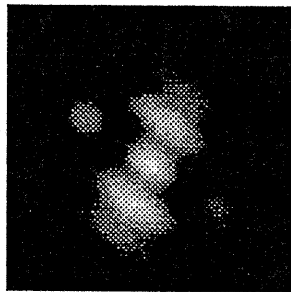


Laboratory data
60 degrees

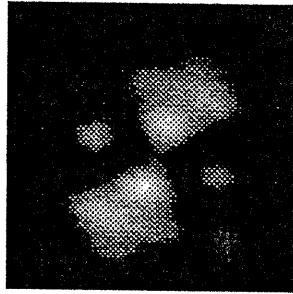
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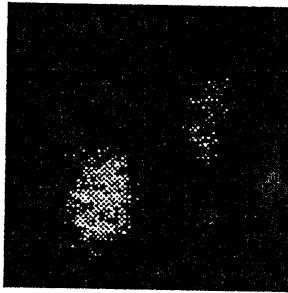
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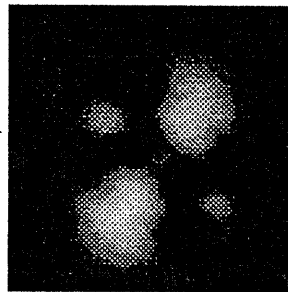
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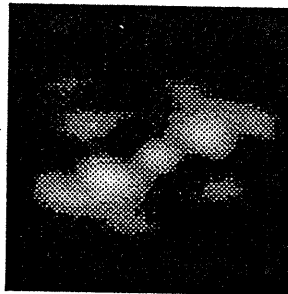
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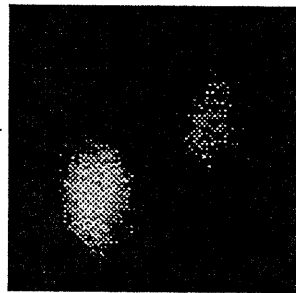
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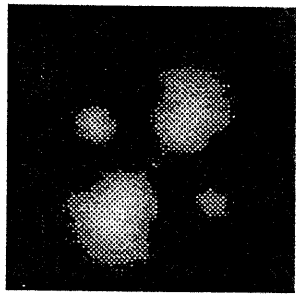
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te1021066.ps



te1621066.ps

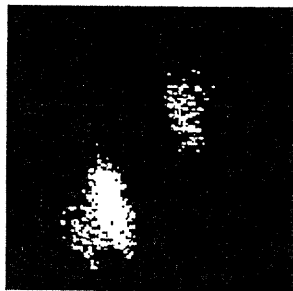


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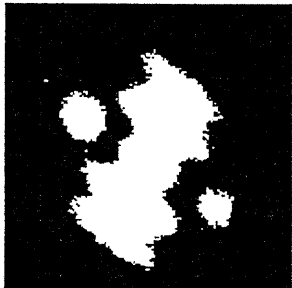


Laboratory data
60 degrees

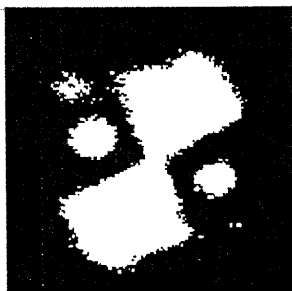
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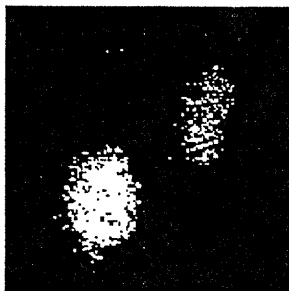
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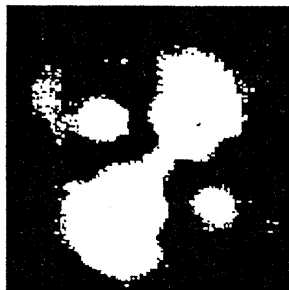
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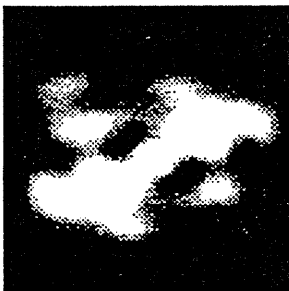
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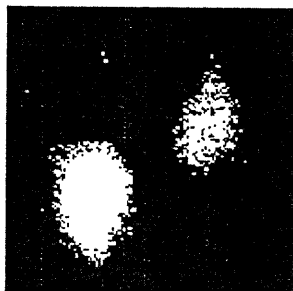
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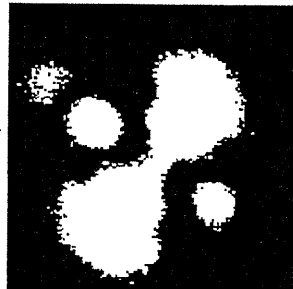
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te1621066.ps

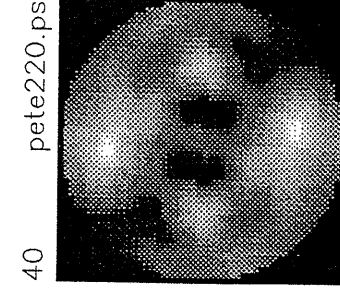
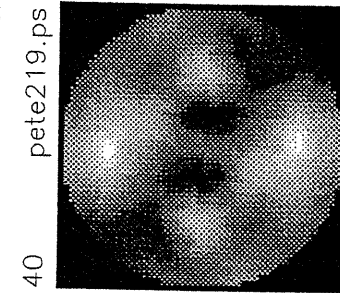
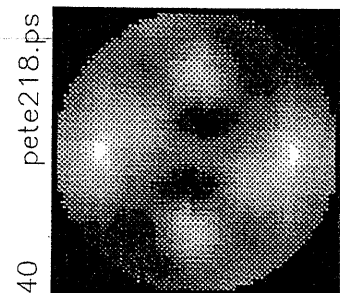
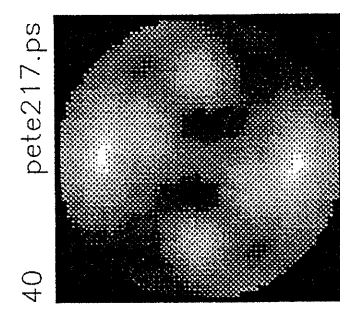
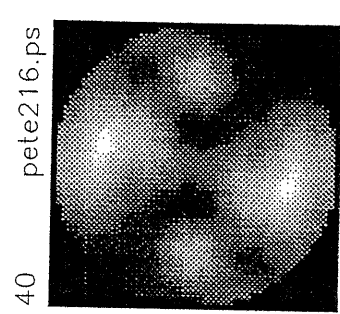
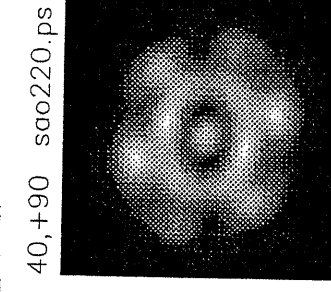
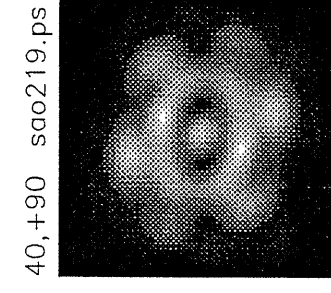
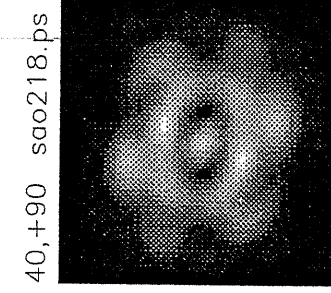
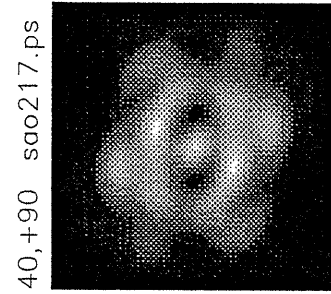
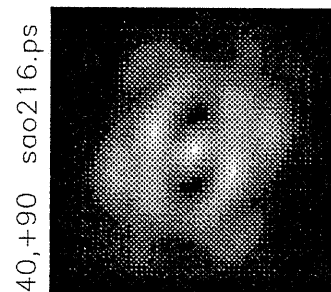
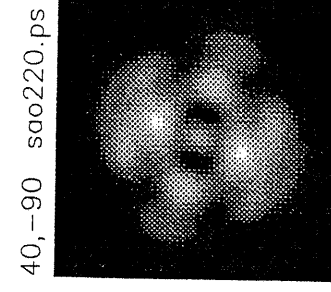
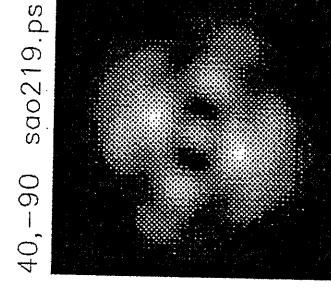
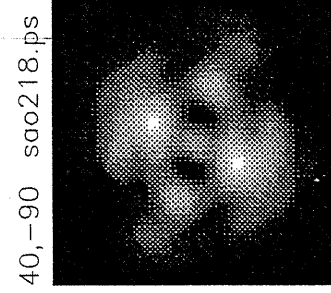
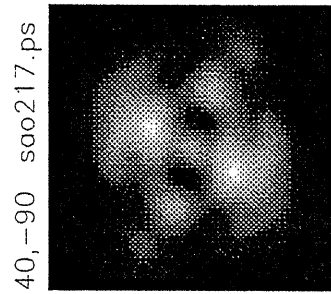
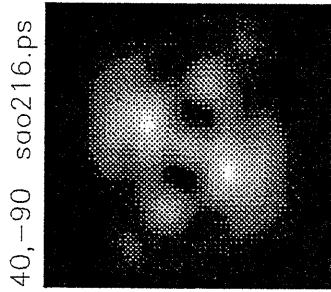


te1621072.ps



Expanded 40 degree plots
Left

sao hexagonal, 6328, 80X80 microradians
orientations -90, +90
pete circular, 50X50 microradians
labdata 80X80 microradians

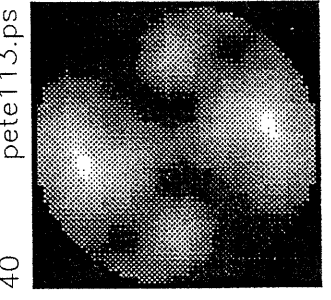
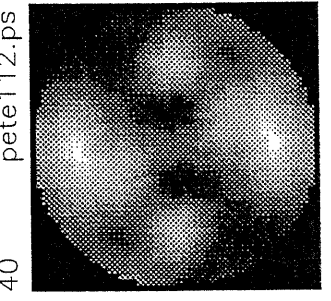
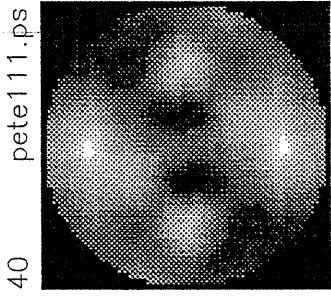
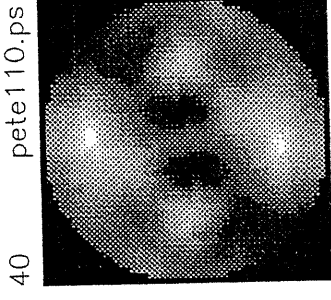
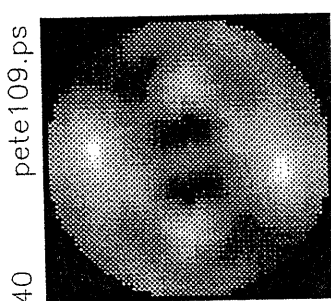
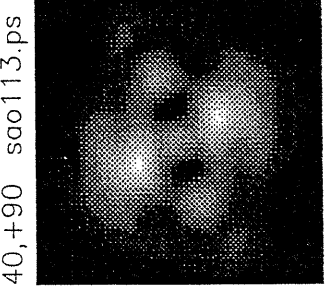
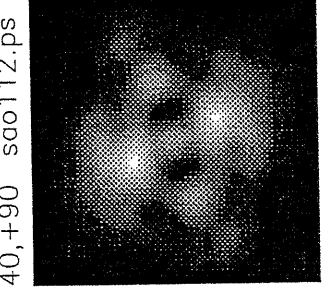
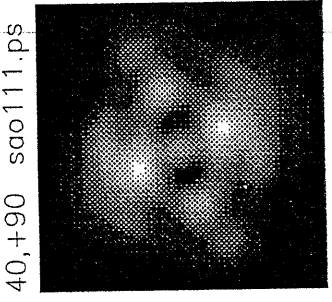
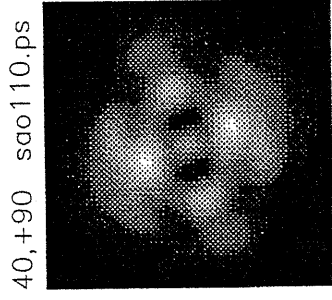
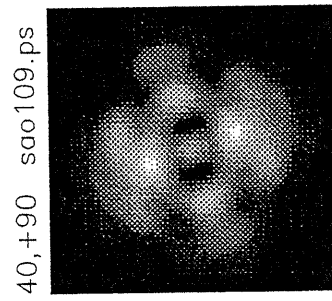
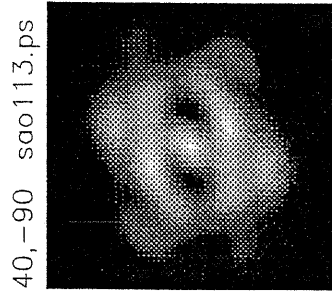
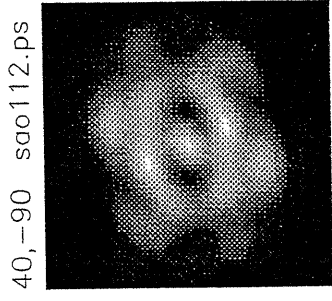
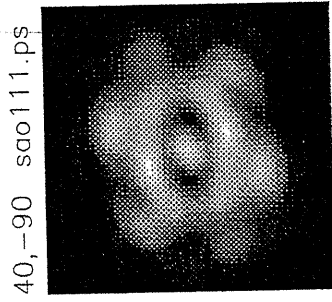
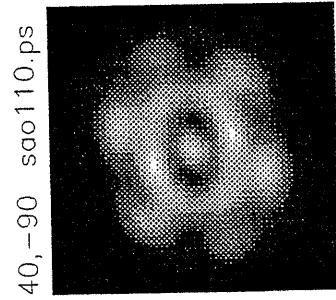
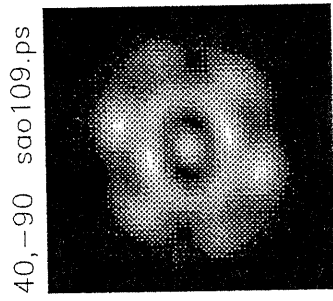


sao hexagonal, 6328, 80X80 microradians
orientations -90, +90

pete circular, 50X50 microradians

labdata 80X80 microradians

Expanded 40 degree plots
Right



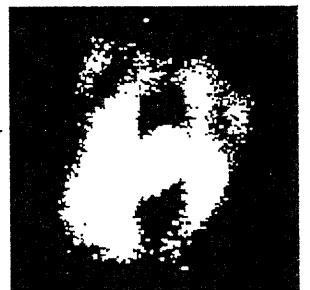
Expanded 40 degree plots
Left

Laboratory data
40 degrees

te0121068.ps



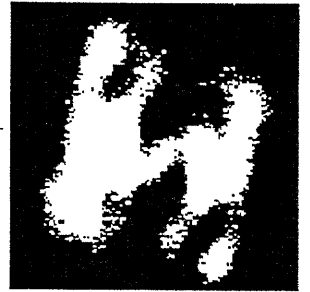
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te0121069.ps



te0121069.ps



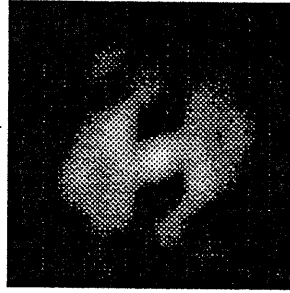
te0121070.ps



te0121070.ps



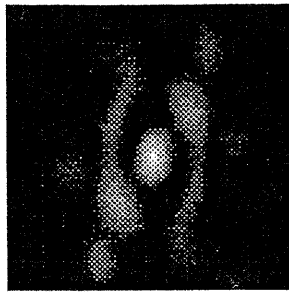
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te0121071.ps



te0121072.ps



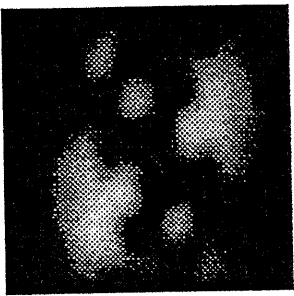
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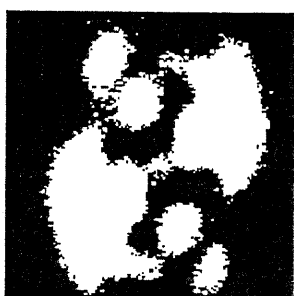
Laboratory data
40 degrees

Expanded 40 degree plots
Right

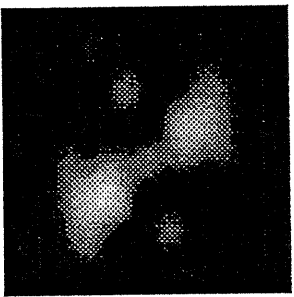
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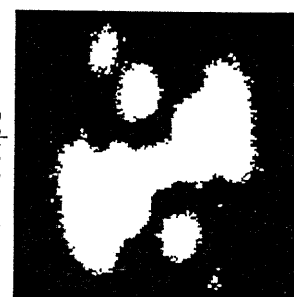
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te0421066.ps



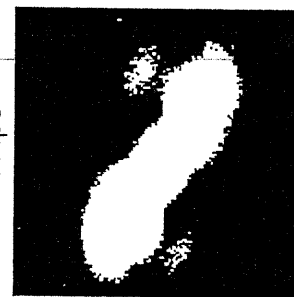
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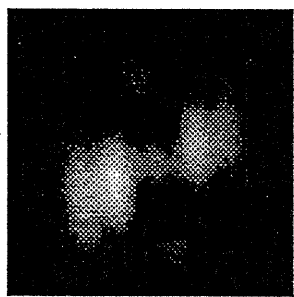
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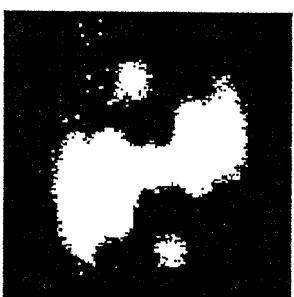
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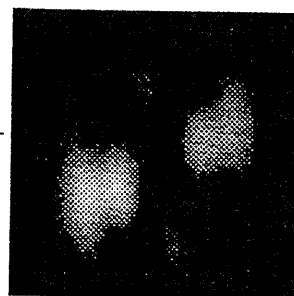
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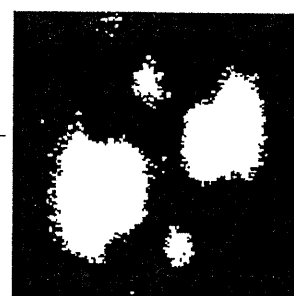
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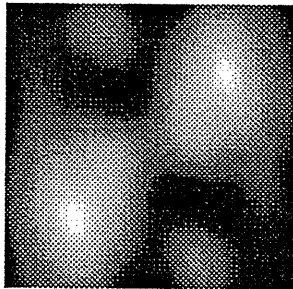


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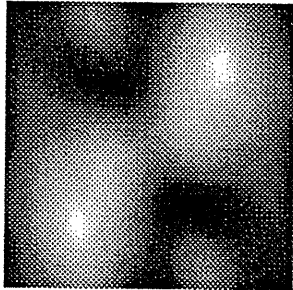


Discontinuity in Pete 40 degree data

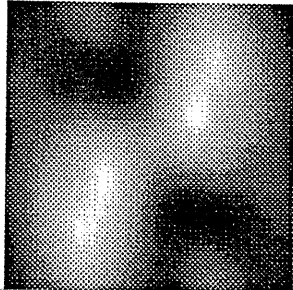
40,+90 sao119.ps



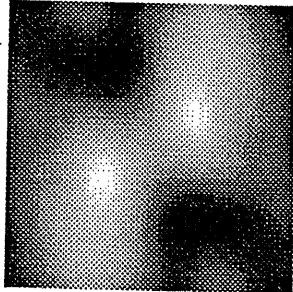
40,+90 sao120.ps



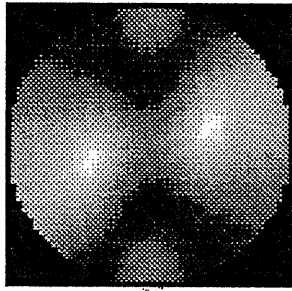
40,+90 sao121.ps



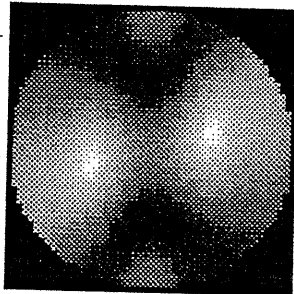
40,+90 sao122.ps



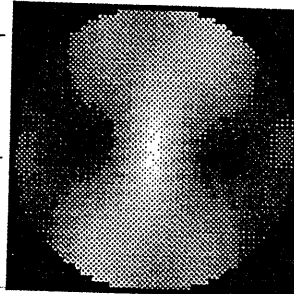
40 pete119.ps



40 pete120.ps



40 pete121.ps



40 pete122.ps

