Observations of ITALSAT with the Effelsberg 100-m

Date: April 28, 1995 from UT 12h to UT 17h

Central frequency: 18.625 GHz
2 Channels with IF-Filters of 2 MHz and 10 MHz

Special Setup by J. Neidhöfer:
[observer.neidhöfer]italsat.pro (Setup)
[observer.neidhöfer]italsat.cross (Cross-Scan)
[observer.neidhöfer]italsat.map (Map)

Fokus-Setting 3C84: SFC2 -23.18

Predicted and fitted positions of ITALSAT: Fig. 1. The telescope was alweays pointed to the fitted positions. The HPBW at this frequency is about 50".

The actual position of ITALSAT was derived by several Cross-Scans. COL* and NULE as a function of time is shown in Fig. 2 and Fig. 3.

The fitted amplitudes from the Cross-Scans are shown in Fig. 4. Variations up to about 40% are indicated.

Beam-maps have been observed : size 10'x10' or 41x41 pixels at 15" sampling. With VAZM=10', one map takes about 50min. Two maps have been observed in-focus (Fig. 5 and 6) and one map off-focus by +1 λ (Fig. 7). The maps have a dynamic range of up to about 35 dB.

Consequences:
a) We need a filter of about 100 kHz width for constant signal strength from ITALSAT. These filters are under construction at Effelsberg.
b) We need a special detector for a higher dynamical range up to 70 dB. This is under construction.
c) The time for mapping is not short enough to rely on a constant pointing. For a pointing better than about 2" in each coordinate, a check of the satellite position is necessary about every 15 min. Differences of the two in-focus maps show clear variations of the sidelobe positions (Fig. 8) due to changes in the pointing.

W. Reich

September 1995

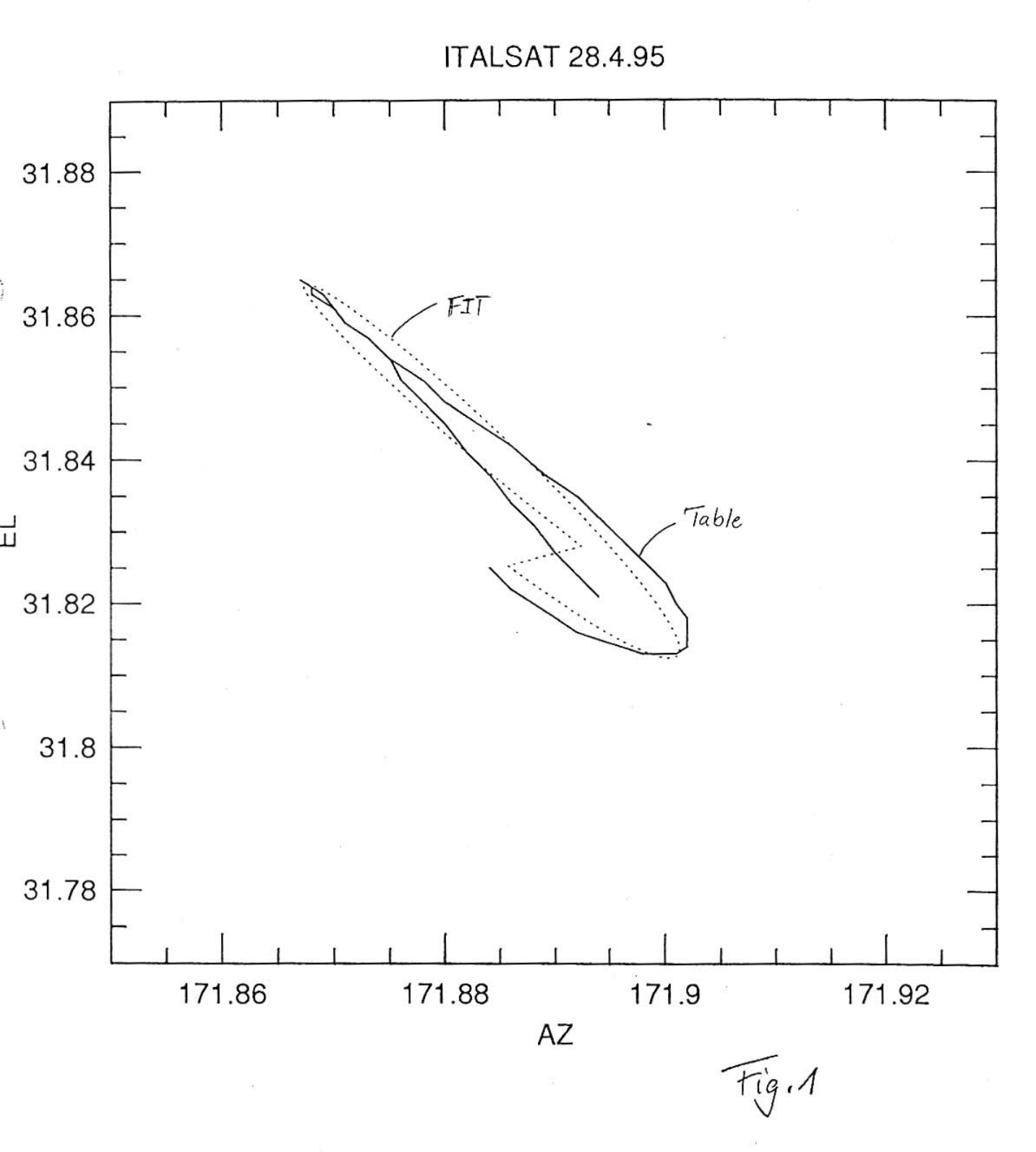

ITALSAT 28.4.95
31.88
31.86
31.84
31.82
31.8
31.78
EL
FIT
Table
171.86
171.88
171.9
171.92
AZ

Fig. 1

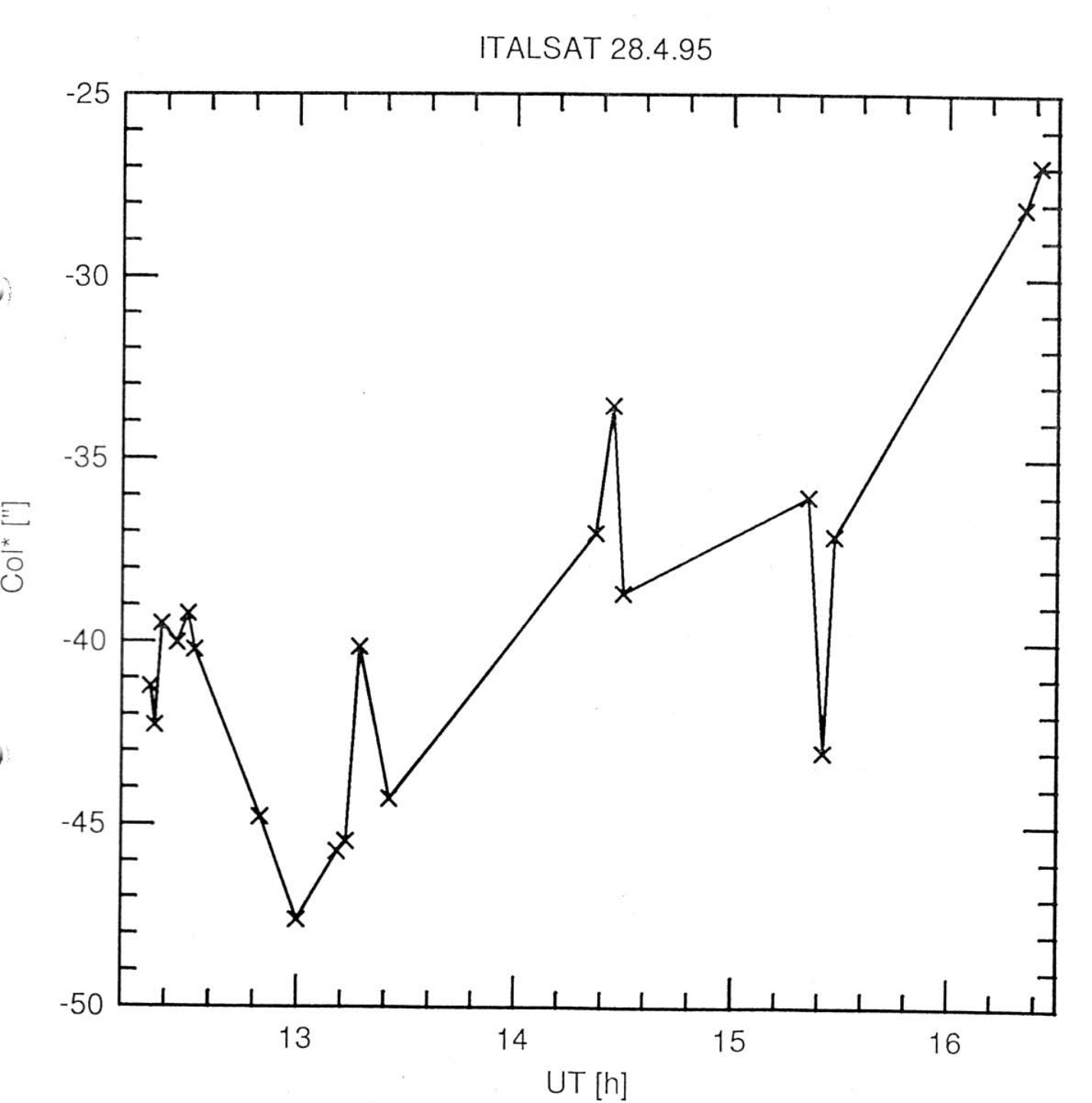


Fig. 2

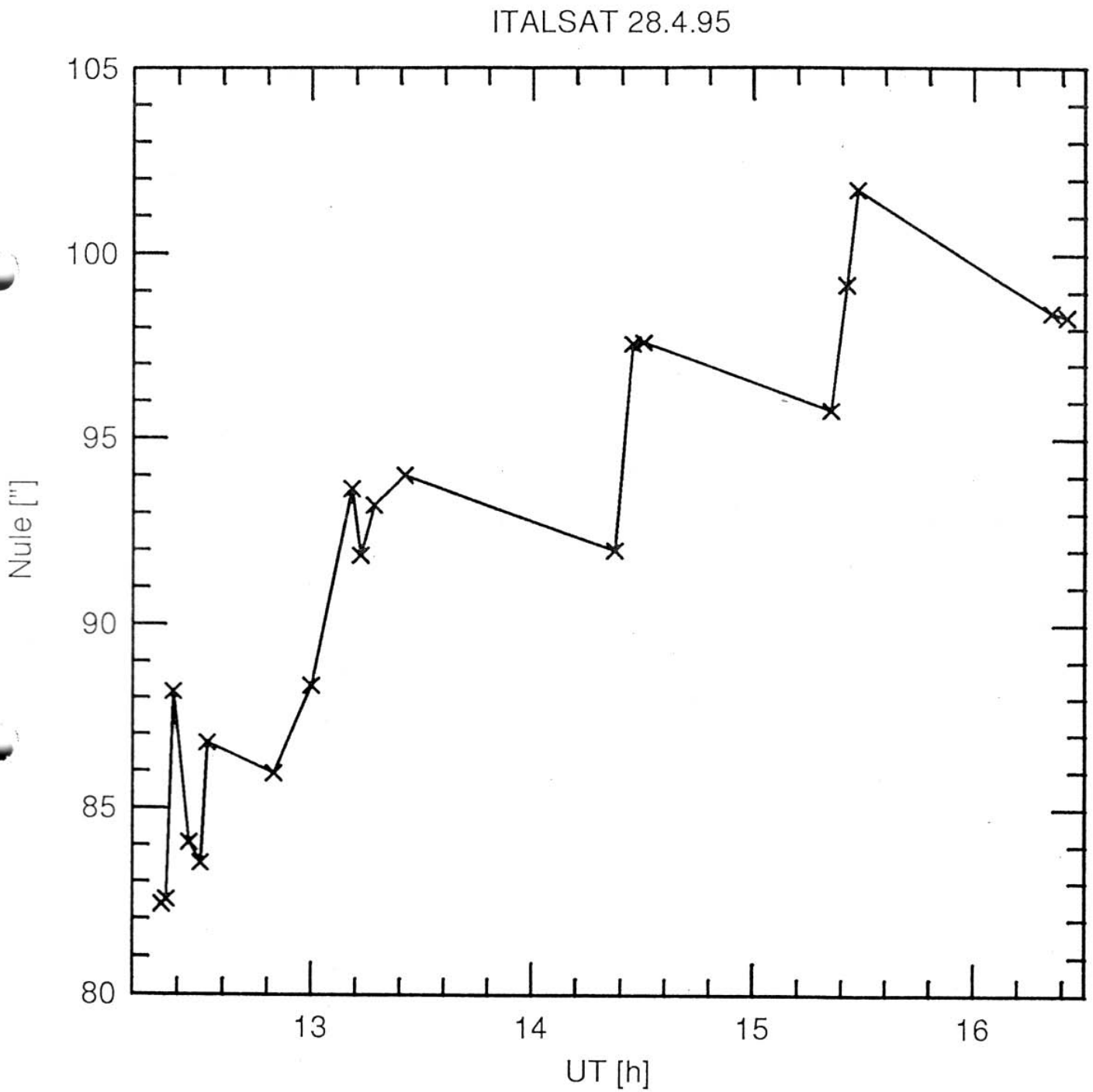


Fig. 3

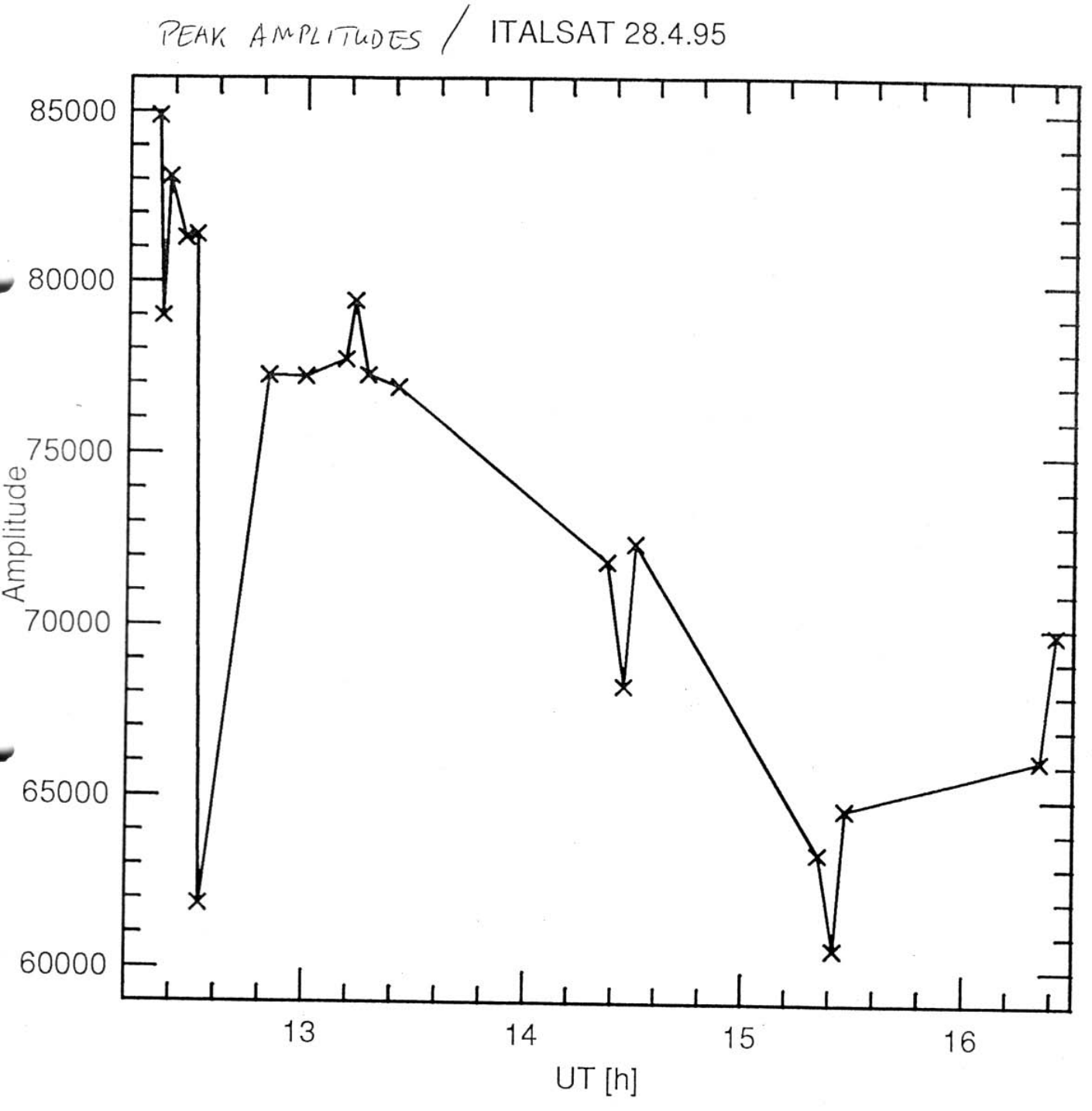
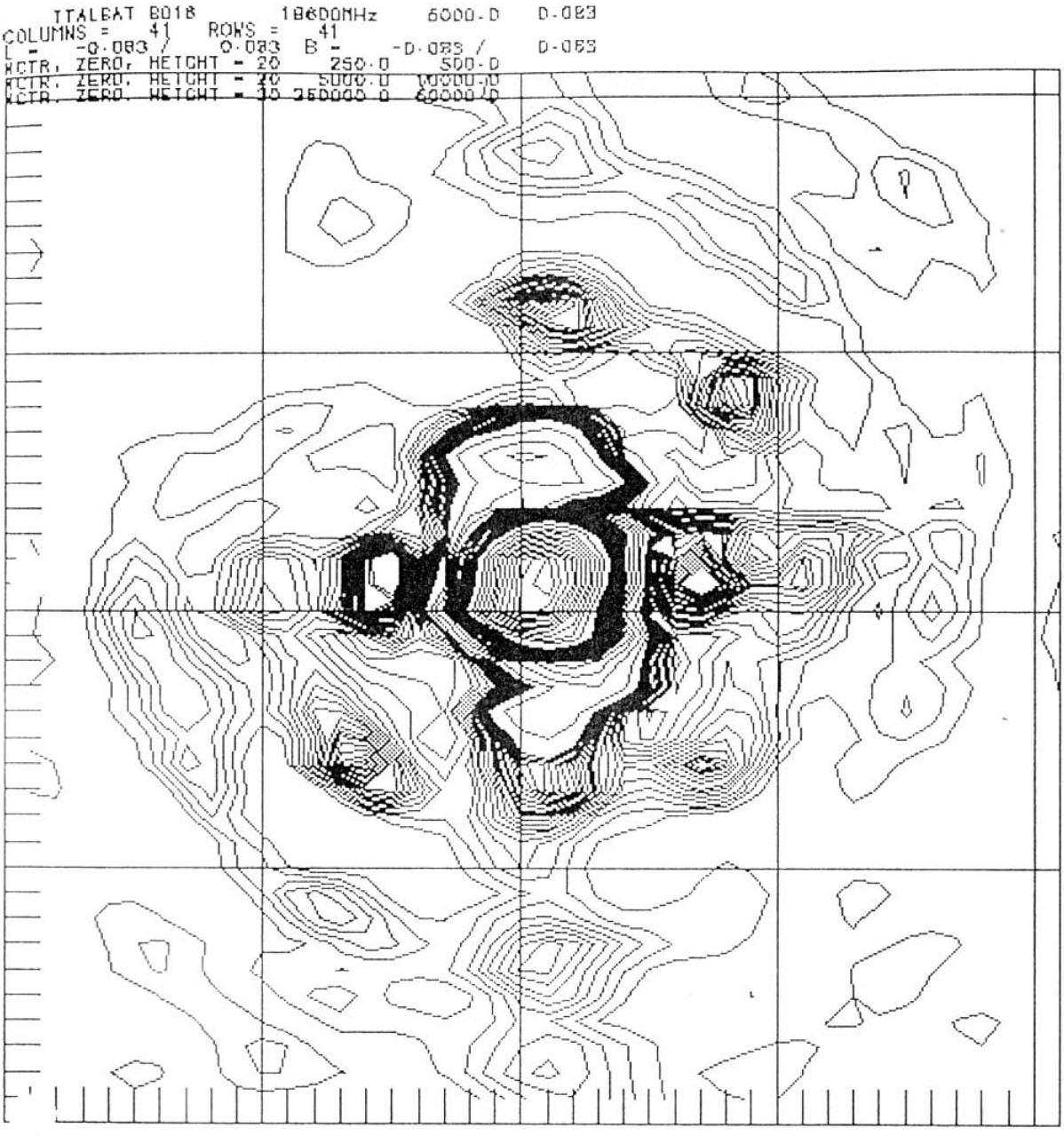

PEAK AMPLITUDES / ITALSAT 28.4.95
85000
80000
75000
70000
65000
60000
Amplitude
13
14
15
16
UT [h]

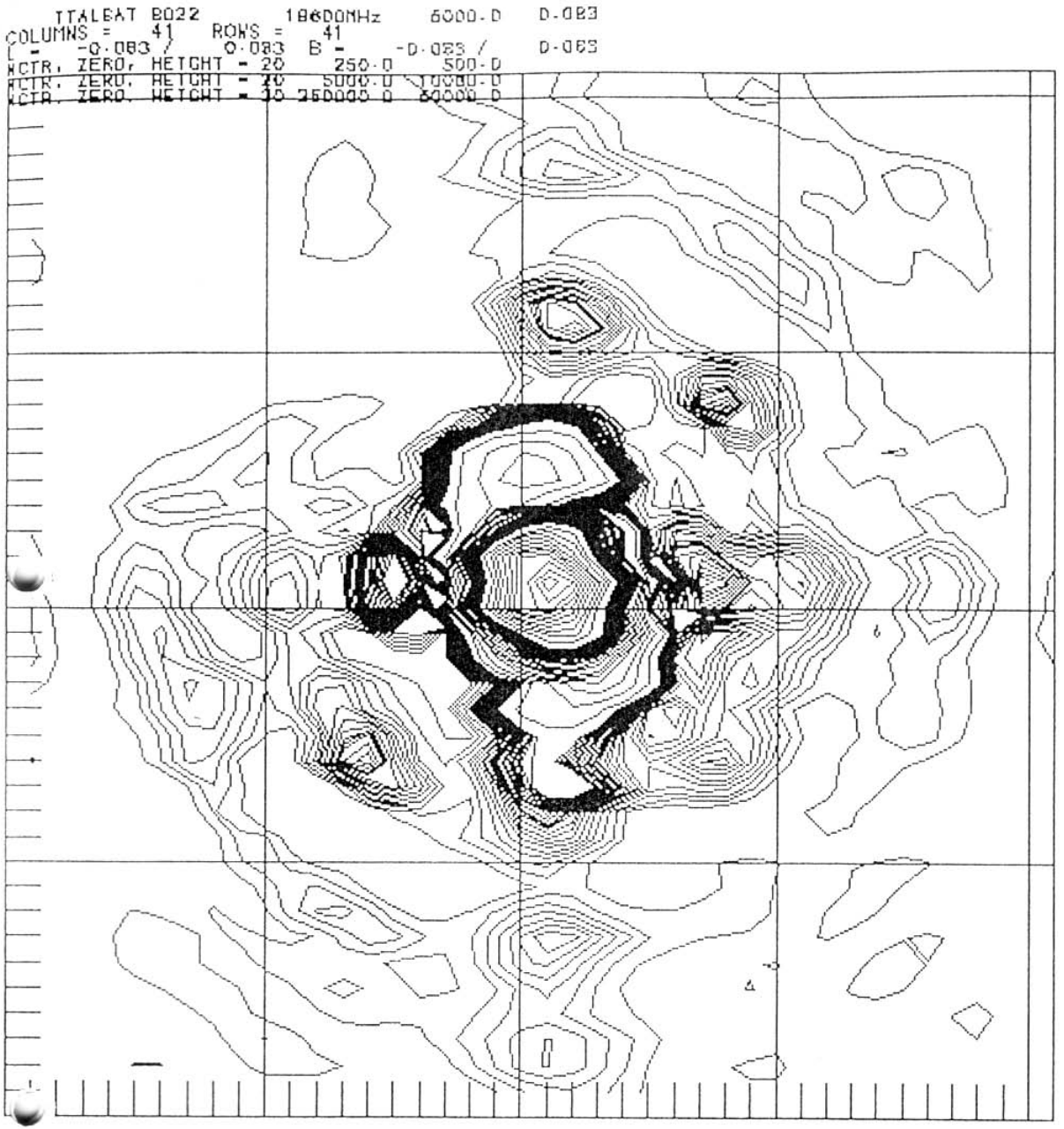
Fig. 4



in-focus

first contour 35.5 dB

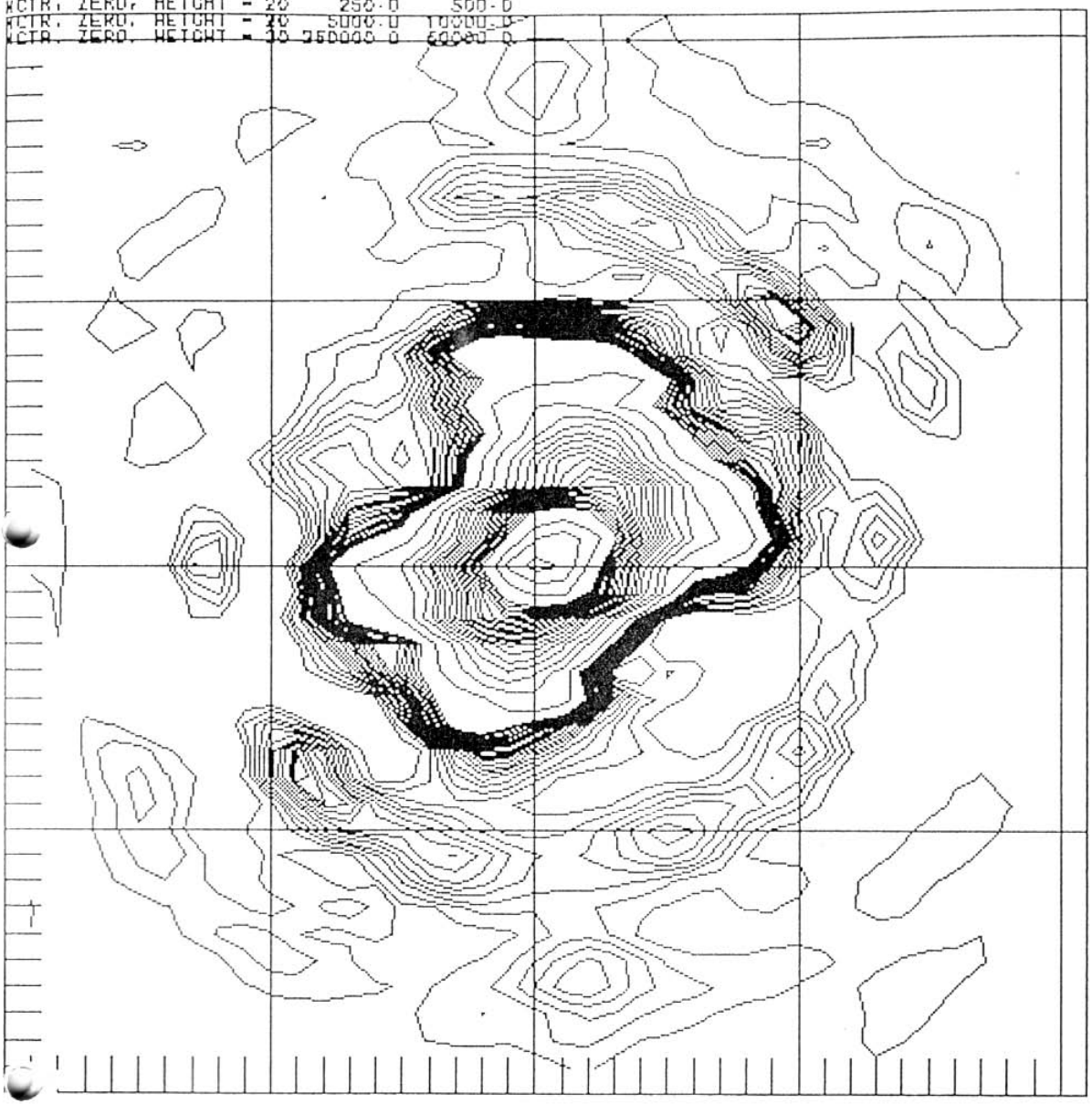
Fig. 5



in-focus

first contour 34.8dB

Fig 6

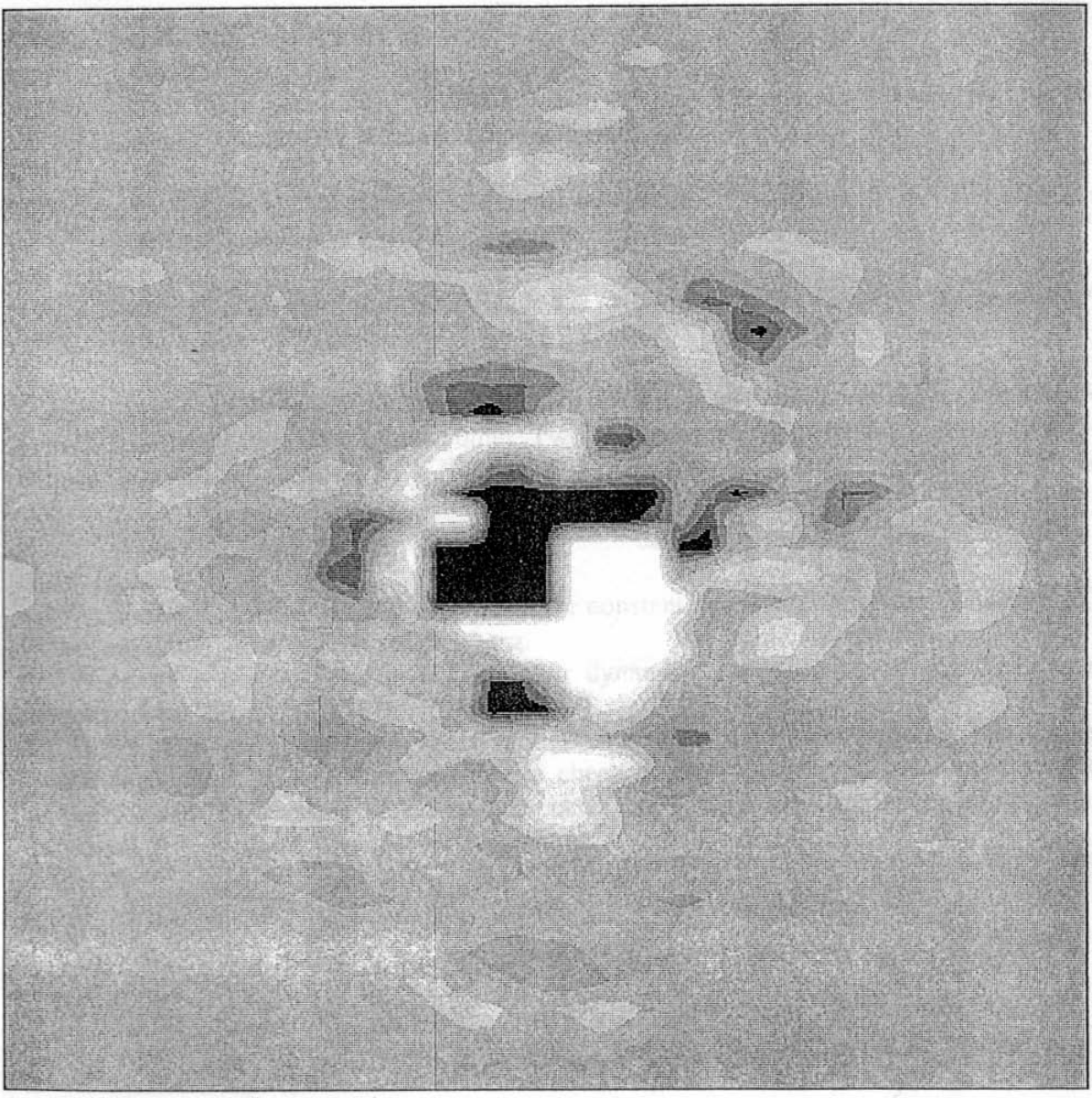


off-focus +1λ

first contour 3,4 dB

Fig. 7

ITALSAT 8016 18600MHz Plane =1
COLUMNS = 41 ROWS = 41
L = -0.083 / 0.083 B = -0.083 / 0.083
MAX = 300., MIN = -300.0 linear



Difference Fig 5. Fig. 8

Fig. 6