BIMA Telescope for solar observations

by

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1. Instrument

BIMA Array - 6 element
synthesis mapping
mid-1991

Upgrade to 9-elements
(NSF)

→ Solar upgrade (NASA)
- Dedicated Patrol telescope

2. Current observing
using 3-element system
Primarily Flares

3. Future Imaging observations

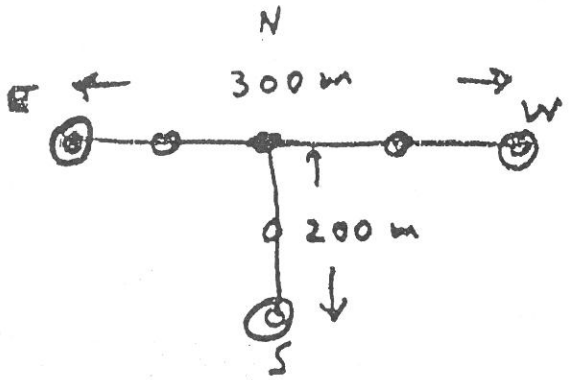
SOLAR A

GRO

Flares, Active Regions,
Filaments
etc. etc.

BIMA

(Berkeley-Illinois-Maryland Mm Array)



70 - 115 GHz ; 70 - 240 GHz

Ant size 6 m

sp. res. ~ 1"

time res ~ 10 sec

now → 0.32 sec

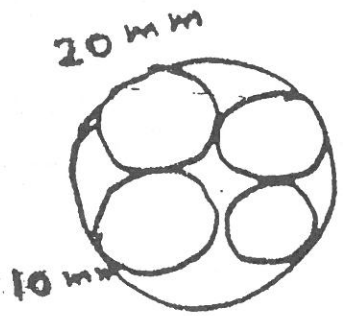
FOV ~ 2'x2' at 86 GHz

freq - 86 GHz

a) Full synthesis → mid-1991
6 ant.

b) Presently 3-element
Quasi-dedicated
Bumping mode

SOLAR-Dedicated



Full sun Patrol

Sensitivity ≈ 0.01 sfu

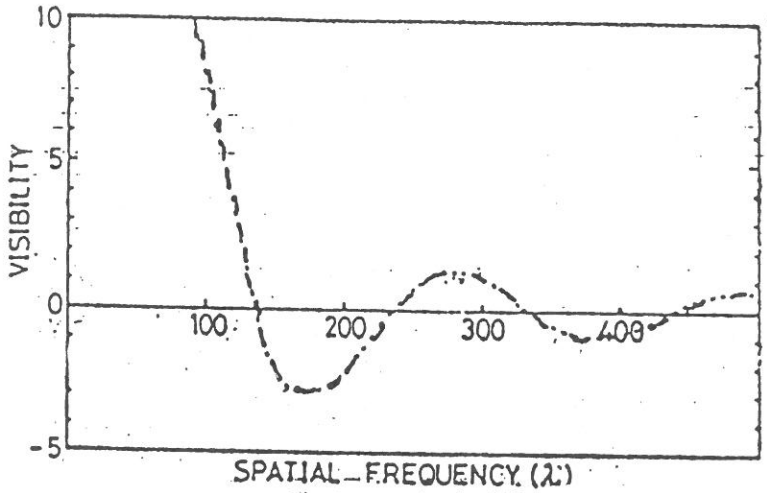


Fig. 1. The visibility function of the quiet Sun at 17 GHz obtained with the east-west interferometer. The abscissa is the spatial frequency in wavelengths. Note that the visibility becomes zero at discrete values of spatial frequency.

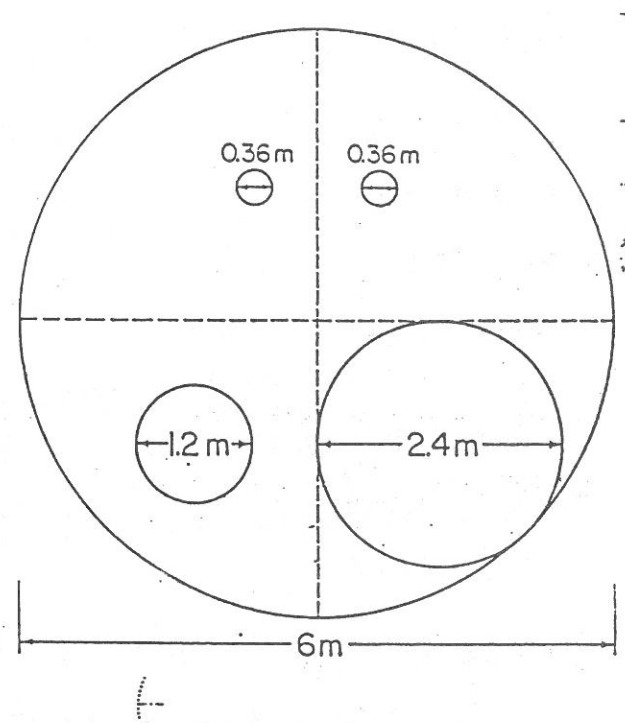


Figure 1: The patches of illumination of the primary 6-m aperture which wi.. provide a 30' beam at each of thethree wavelengths.

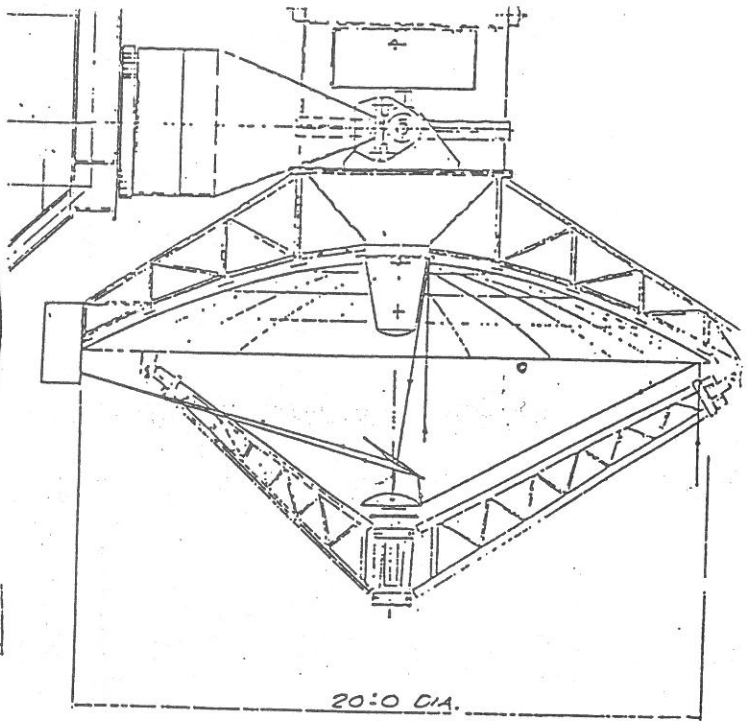
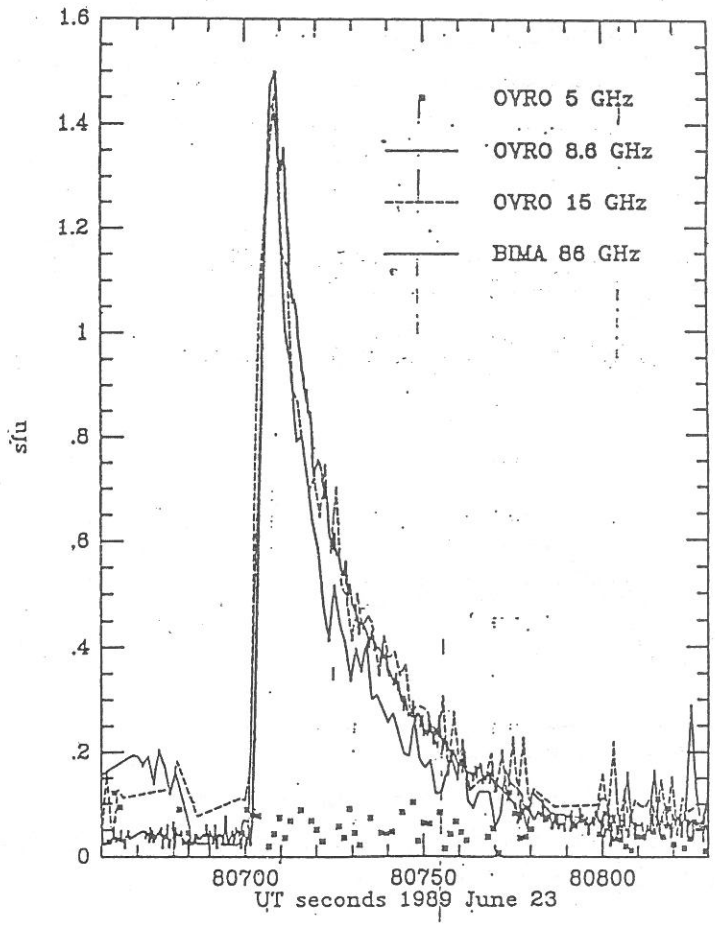
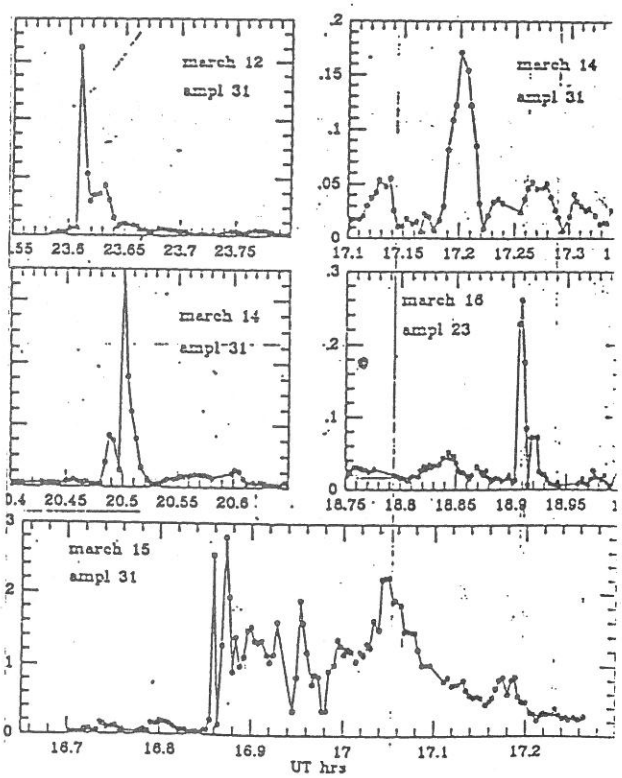
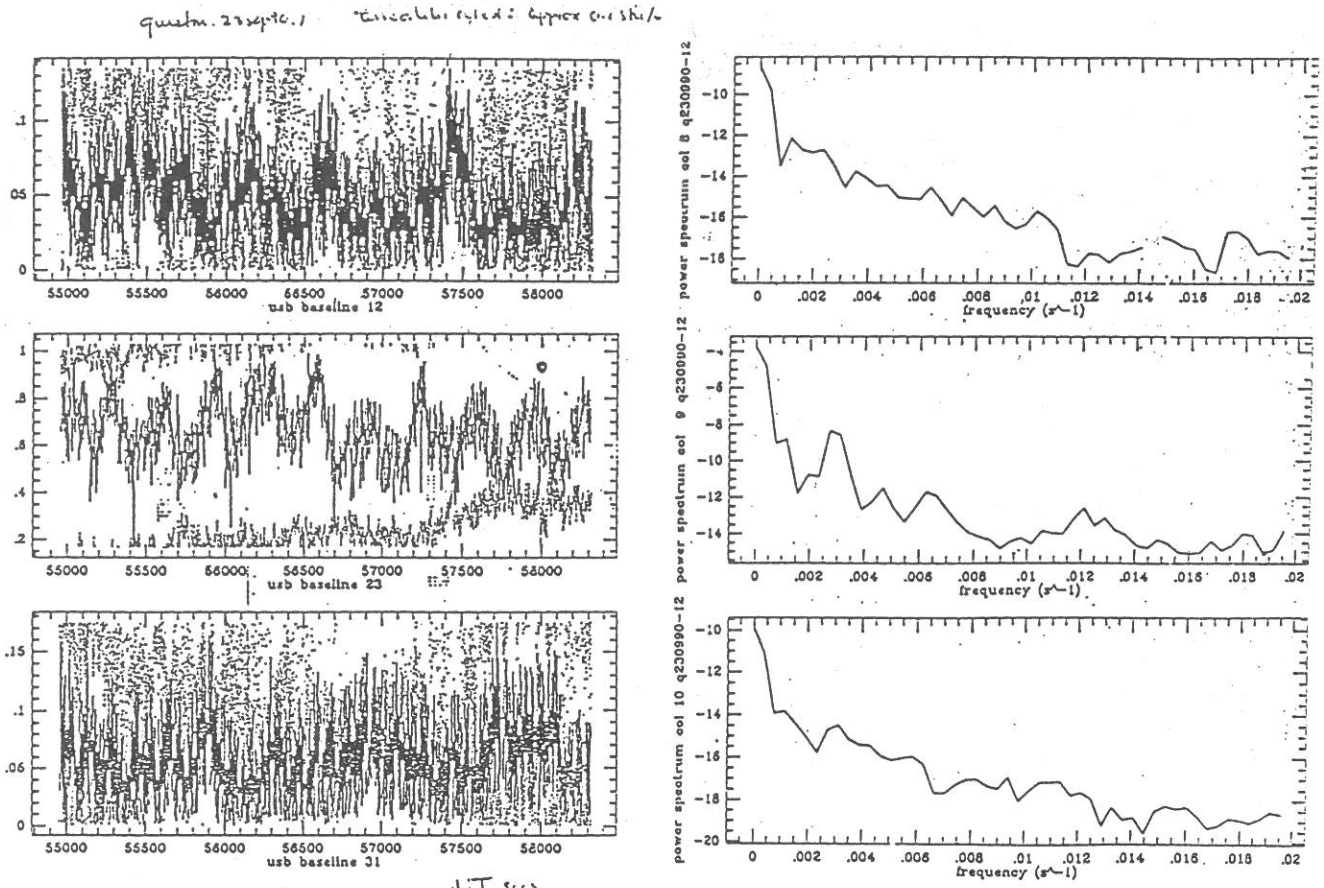


Figure 2: The optical arrangement for separating the four beams for th.e three different wavelengths, which allows simultaneous observations at the three wavelengths. The nearly flat tertiary mirror is actually a shallow pyramid which sends beams corresponding to the four sectors of the primary into different directions to the four receivers in the receiver box at the edge of the primary reflector. The rays are shown for only one of the beams.



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usb baseline 23
usb baseline 31
power spectrum col 8 q230990-12
power spectrum col 9 q230990-12
power spectrum col 10 q230990-12
frequency (s^-1)
UT secs