METER AND DECAMETER WAVELENGTH POSITIONS OF SOLAR RADIO BURSTS OF JULY 31–AUGUST 7, 1972

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Abstract (*Solar Phys.*). The positional analysis of solar bursts at meter and decameter wavelengths during the period July 31–August 7, 1972 is presented. The observations were taken with two arrays – a log periodic array of 16 elements situated on an E–W base line of 3.3 km and portions of the new Clark Lake array in the form of a Tee (an E–W arm of 32 log spiral antennas and a N–S arm of 16 similar antennas). The new array operates over the frequency range 10–120 MHz and has angular resolutions of approximately 3.′5 at 100 MHz and 8.′5 at 40 MHz in the E–W direction.

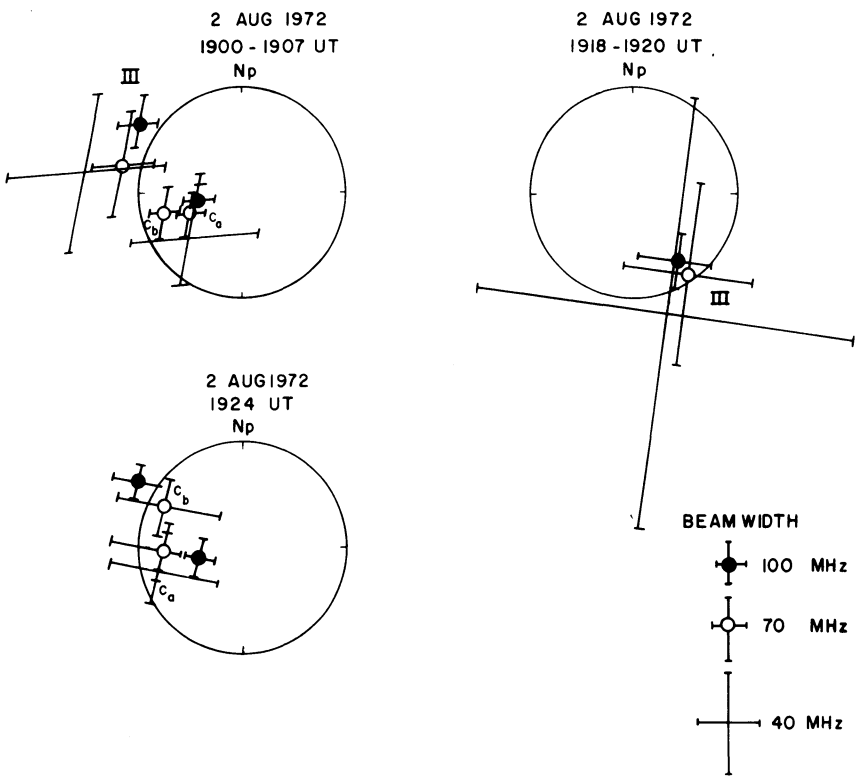

Fig. 1. Positions of type III and continuum bursts for August 2, 1972. The big circle represents the optical disk. The radio positions were obtained from a combination of both E–W and N–S data. These positions are given by the radius vector from the Sun's center and a position angle measured to the east from the north pole of the Sun. The E–W and N–S sizes of the burst sources are indicated by the lengths of the lines aligned with the appropriate angle.

Gordon Newkirk, Jr. (ed.), Coronal Disturbances, 231–233.

In the N–S direction the instrument has a resolution of 6′ at 100 MHz and 15′ at 40 MHz. During this period the activity was often so complex that we represent it only by 'snapshots' taken at representative times at three representative frequency ranges 90–110 MHz, 60–80 MHz and 30–50 MHz. Most of the activity during this period was associated with the active regions McMath 11976 and 11970. The radio-

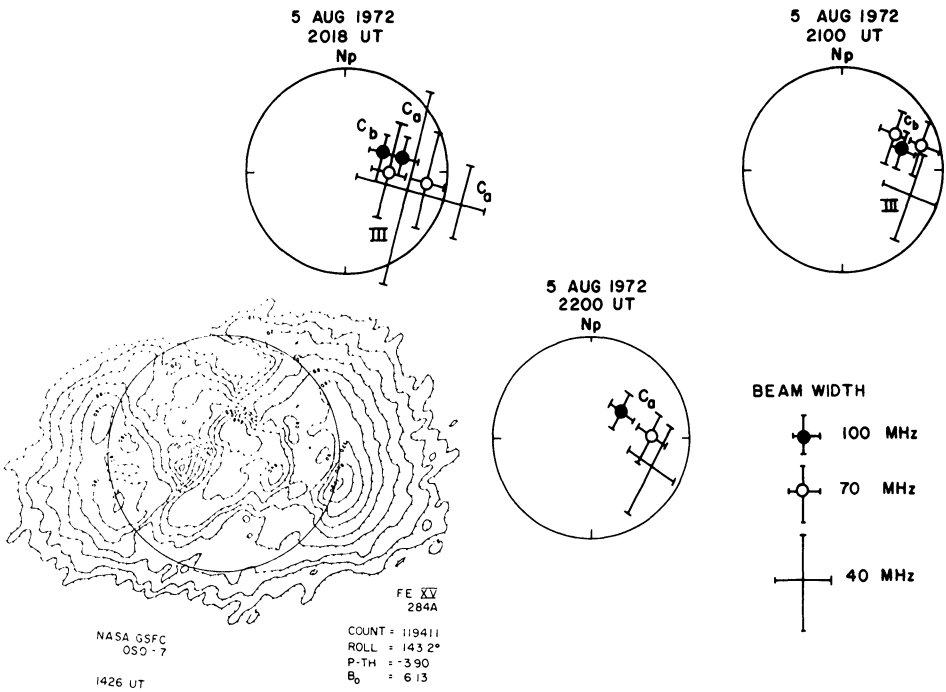

Fig. 2. Positions of bursts for August 5, together with the Fe xv line (284 Å) map obtained by NASA-GSFC OSO-7. The radio positions are indicated in the same way as for August 2 (Figure 1).

emissive regions were also closely associated with the Fe xv (284 Å) coronal maps produced by NASA-GSFC from OSO-7 observations (Figures 1, 2 and 3). Except near the CMP of the region 11976, two regions of continuum emission were often observed – one a relatively smooth continuum and the other a continuum superimposed with many type III's and other fine structure. It seems possible to interpret these continua in terms of plasma waves originating from two sources located at different heights or with different electron density gradients. The angular size of type III sources seems to increase with decreasing frequency. This implies that the open field lines along which the type III electrons travel have larger angular extent at greater height.

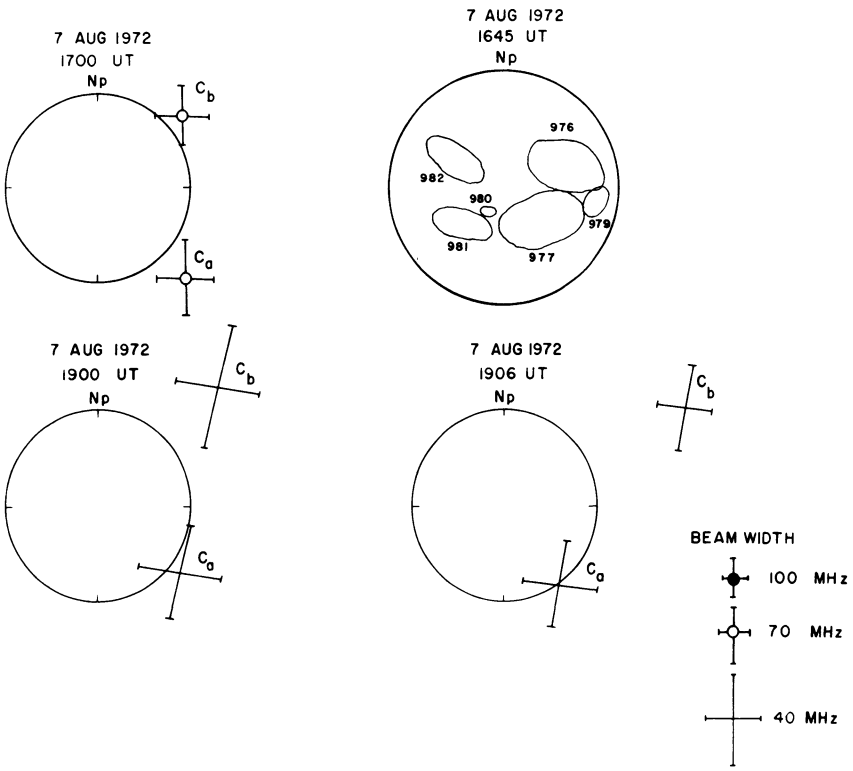

Fig. 3. Positions of bursts for August 7, together with the McMath-Hulbert Calcium report. The positions are indicated in the same was as for August 2 (Figure 1). Note the displaced position of the continuum source C_b at 1906 UT relative to its position at 1900 UT, which indicates an ejection with a velocity of about 1400 km s^{-1} from the parent continuum source.

COMMENTS

Pick: Did you observe any sudden variation of the diameter of type III's with decreasing frequency?

Erickson: The size generally increases with wavelength but that is not always so.

Zirin: Have you seen something connected with the huge brightening of the flare on that day (August 2, 1972)?

Erickson: The radiation became darker and darker.