Observations of solar continuum emission at decameter Wavelengths

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Abstract

We observed the continuum emission from the radio sun when there is no burst activity at λ = 8.7 m with the large decameter wave radio telescope at Gauribidanur (Latitude 13° 36' 12" N and 77° 27' 07" E) with a resolution of 26'/40'. A compound grating interferometer with one dimensional resolution of 3' is also used. These observations are made during August 1983 and June 1986. The brightness temperature at the center of the sun varied from 0.2 10^6 K to 0.8 10^6 K during these periods on time scales of several hours to a day. Since the sun is absolutely quiet during these periods we believe that the radiation is purely thermal in nature. In this case the observed brightness temperature variations imply large scale density variations by more than a factor of three if the corona is optically thin at these wavelengths. Alternatively if the corona is optically thick the observations imply real electron temperature variations with or without accompanying density variations.

(A full account of this paper will be published elsewhere).

DISCUSSION

GELFREIKH: Dr Borovik at Pulkovo Observatory has detected a decrease of solar radio radius at dm wavelengths when a coronal hole is at the limb. Did you try to detect a similar effect with your instrument?

SASTRY: Yes. We have observed similar effects at 34.5 MHz. A comparison of our scans with those of Nancay (169 MHz) reveals that the effect is more pronounced at decametric wavelengths.

LANG: Is the displacement observed between the 34.5 MHz emission peak and the centre of the Sun concentrated toward the equator or above active regions?

E. R. Priest and V. Krishan (eds.), Basic Plasma Processes on the Sun, 513–514.

KUNDU: What Sastry has shown is that at the time of solar minimum, there is a small displacement of the image (at 34.5 MHz) centred from that of the Sun centre. If one assumes that this small displacement is due to ionospheric refraction, then there must not be any contribution from condensations to the decameter emission at solar minimum. This implies that only the quiet Sun thermal emission is being considered.

SASTRY: Yes, I agree.

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