RATAN-600 OBSERVATIONS OF MICROWAVE STRUCTURE OF THE QUIET SUN

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To investigate microwave emission of the quiet Sun the observations with RATAN-600 from September, 2005 to March, 2006 in the range 6-16.4 GHz with the 1% frequency resolution were used.

We present an analysis of observational data for several days with different positional angles. A small-scaled structure with the size of 20-40 arc sec is regularly observed with RATAN-600 one-dimensional observations. A high degree of correlation for separate elements of the structure in the different frequencies channels at all band of the observations exists. Our estimates of an average life time are several hours. There is a direct dependence between the sizes and life of time for separate elements.

The spectra of brightness temperatures grow with wavelength. The emission polarization is very likely negligible. The characteristics of presented observed structure are very close to ones of a super granulation (chromosphere network) which is not sufficiently investigated in microwaves. The separated bright sources are identified with bright X-ray points or bipolar magnetic structure.

Our modeling demonstrates that the structure of the chromosphere network can exist in a wide spatial range, but really only the sources with the sizes of 20-40 sec of arc can be detected at microwaves. Possible mechanisms of such radio emission are discussed.

The daily monitoring with RATAN-600 observations provides possibilities to regularly estimate a state of the quiet Sun by emission characteristics of microwave small-scaled structure and to trace rises of new centers of activities.

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