A Model Calculation of Solar Microwave Burst Structure

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The structures of 17GHz microwave burst for bipolar sunspots have investigated, which included the effects of the projected shapes of radio sources as they traverse across the solar disk using a magnetic loop employing a model of solenoid coils. An ensemble of high-energy electrons confined in the loop be assumed. The projected brightness distributions of gyrosynchrotron emission in x- and o-modes are computed and converted into total intensity and circular polarization difference at 17GHz for various heliocentric distances using numerical integration of the transfer equation along the line of sight. The results of computations at 17GHz for optical thin case will be presented, and the effects of the orientation of the loop will be discussed in detail, as well as the effect of size, position, structure, and polarization of the emission. Also the results of the various physical parameters such as the strength of magnetic field, high and low energy cut-off of accelerated electrons, spectral index and density of electrons will be presented. After comparing the results of model calculation with observations, we found that the observations can be well explained in terms of a loop model and its projection effect.