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太陽フレアループトップ電波源の高度の時間変化
Temporal and spatial variations of loop-top microwave sources during the whole period of a solar flare

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We report an analysis result of NSRO-CDAW10 (Coordinated Data Analysis Workshop) that was held at Nobeyama Solar Radio Observatory from Oct. 25 to Oct. 29, 2010.

When a solar flare occurs, a large amount of electrons are accelerated, they emit hard X-rays, gamma-rays and microwaves. Especially, the nonthermal emissions from flare loop-top sources are related to acceleration/transportation processes of electrons under the magnetic reconnection point. So in order to understand acceleration/transportation processes of electrons under the reconnection point, it is important to study temporal and spatial variations of loop-top sources by using data of multiwavelength observation.

We studied an M3.7 class flare which occurred on Jul. 27, 2005. This flare took place behind the limb. So we can see only loop-top source itself without any effects of emissions from the footpoints. We used two frequency data of Nobeyama Radio Heliograph (17GHz and 34GHz, both of them are emitted by MeV electrons). According to a simulation (Minoshima et al. submitted to ApJ), we expect that loop-top microwave source of 34GHz is located lower than that of 17GHz, because higher energy electrons which emit 34GHz microwave can reach to a lower altitude with less collisions during the transportation. But we got a result that the loop-top source of 34GHz was located higher than that of 17GHz during the whole period of the flare. And it was found that around the peak time of the flare, the height difference between the 17GHz and 34GHz loop-top sources became larger. In this presentation, we discuss why the loop-top source of 34GHz is located higher than that of 17GHz, and why the height difference between the 17GHz and 34GHz loop-top sources becomes larger around the peak time of the flare.