[S11-5] Extreme Scattering Events and Primordial Black Holes

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The extreme scattering events are occultation events of radio emitting sources whose lightcurves are severely modulated by occulters (or lenses) that contain high density of free electrons. It has been considered that the lenses might be peculiar structures of interstellar medium but the nature of the lenses are still a mystery. Recently, however, it has been proposed that they may be binary primordial black holes (PBHs) or PBH-like MACHOs in the interstellar medium. We investigate the event distribution by taking into account various halo profiles and the distribution of interstellar medium. Future observations may confirm whether the lenses are galactic objects or dark objects explaining the missing mass of our galaxy.

[S12-1] Evaluation of Solar Radio Burst Locator(SRBL) at OVRO

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Solar Radio Burst Locator (SRBL) is a spectrometer that can observe solar microwave burst over wide band (0.1-18 GHz) as well as detect the burst location without interferometry or mechanical scanning. Its prototype has been operated at Owens Valley Radio Observatory (OVRO) since 1998. In this study, we have evaluated the capability of the SRBL system in terms of flux and radio burst location measurement. For this, we consider 130 microwave bursts from 2000 to 2002. The SRBL radio fluxes of 53 events were compared with the fluxes from USAF/RSTN and the burst locations of 25 events were compared with the optical flare locations. From this study, we found: (1) there is a relatively good correlation (r = 0.9) between SRBL flux and RSTN flux; (2) the mean location error is about 8.4 arcminutes and the location error (4.7 arcminutes) of single source events is much smaller than that (14.9 arcminutes) of multiple source events; (3) the minimum location error usually occurred just after the starting time of the bursts, mostly within 10 seconds; (4) there is a possible anti-correlation (r = -0.4) between the pointing error of SRBL antenna and the location error. The anti-correlation becomes more evident (r = -0.9) for 6 strong single source events associated with X-class flares. Our results show that the flux measurement of SRBL is consistent with that of RSTN, and the mean location error of SRBL is estimated to be about 5 arcminutes for single burst events.