RADAR OBSERVATIONS OF LEONIDS IN JAPAN

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We are observing meteor showers using the MU radar located at Shigaraki, Japan. This is a Mesosphere, Stratosphere and Troposphere radar, belonging to the Kyoto University, with a frequency and a peak power of $46.5MHz$ and $1MW$, respectively. This system is characterized by the versatility of the antenna array. By using four antennas out of 475 Yagi arrays together with four receiver channels, we can observe more than several hundred meteor echoes per hour. The beam applied at the meteor observation is a static "doughnut beam", which is the rotational symmetrical pattern to the vertical line. This beam is effective enough to detect meteor echoes of which the zenith angle is smaller than about 50°, which characterizes the MU radar as an all sky monitoring radar of meteor echoes. For the low velocity meteors, most of the echoes satisfy a condition of the perpendicular reflection, and we can derive the position of the radiant point statistically, and succeeded its application for the Geminids (Watanabe et al. 1992a). For the high velocity meteors, most of the echoes are in the overdense condition. However, we can discriminate the echoes of a specific meteor shower out of the data by checking the echo duration, the height, the strength or the combination of them. We have been monitoring the Perseids from 1990, and succeeded to reveal the unusual activity in 1991 (Watanabe et al. 1992b). For the Leonids, we are continuing the observation from 1991. The drastic increase of the activity has been detected around 23h UT on November 17, 1994. The number of the observed long duration echoes, which came from possibly bright Leonids meteors, were 80 per hour. This should be the beginning of the Leonids activity toward the 1998-1999. We are planning to continue this observation until the end of the activity in the 2000's.

References

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