

# Estimation and validation of incident direction of meteor echoes by 6-channel HRO

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Ham-band radio meteor observation (HRO) has been remarkably developed and successfully used for activity monitor of meteor showers even in cloudy night or in daytime; whereas direction of incident electromagnetic waves from each meteor were cannot be derived by prevalent HRO. In order to investigate the characteristics of HRO echoes, a trial of 6-channel HRO (6chHRO) was begun in 2003 at Kochi University of Technology. The 6chHRO consists of horizontal 4-azimuth observations and vertical 2-polarizations. During the Geminids period in 2003, a simultaneous observation of 6chHRO and optical imaging was operated. Comparing the meteor echoes of 6chHRO with optical observations, anisotropy among signal strength of each channel measurement was clearly confirmed and reflection region of the forward-scattering radar was qualitatively investigated.

For the long echoes of a few tens seconds or longer, meteor trains of these meteors could be fluctuated by upper atmospheric wind and long echoes observed by almost all channels by different signal levels, so that estimations of incident directions of these echoes can be realized in assumption with beam pattern of antennas and attenuation effect depended on slant range of electromagnetic waves. Recently, video meteor observations by powerful tools of high-sensitivity CCD camera WAT-100N and motion-capture software UFOCapture have been spread to amateur observers, so that considerable results of meteor trajectories were obtained and gradually collected as database. In case of the corresponding meteor was optically observed at faraway region from 6chHRO site, validation of the azimuth estimation of each long echo could be carried out. In this talk, efficiency of 6chHRO (or 4-channel HRO) in the context of azimuth estimation for long echoes will be discussed.