

Head echo observation with the MU radar 25 channel interferometer: (2) Software development

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Following the related talk by Miyamoto et al., we will present technical aspects of the Shigaraki MU-radar meteor head echo observations with its 25-channel interferometer.

The MU-radar system is characterized by its flexible control system, with which the new head echo observation becomes possible. Key analytical elements of head echo observations are, (a) Doppler pulse compression, (b) spectral oversampling method, (c) Fourier imaging (aperture synthesis) methods, and (d) least-square fitting of meteor parameters. While (a) and (b) are inherited from the previous MU-radar 4-channel interferometer observation (e.g., Nishimura et al., 2001), there are several new features in (c) and (d): (c) is needed to account for a significant increase of the number of elementary systems of interferometer. This method allows a reliable determination of the orbit parameters of meteors which can coexist simultaneously. (d) is a method which is usually used to determine the meteor positions and speeds. With the new system, a precise determination of the deceleration rates of meteors as well as their error estimation become also possible.

In the presentation, we present the above features as well as the preliminary results of test observations made during the Geminids shower in December 2008.