

## TIME DOMAIN ECHO CLUSTERING OF MST RADAR

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MST radar echoes are resulted from the scattering of targets within a radar volume. Fluctuations and Doppler motions of such scattering targets that are in variant intensities contribute to the radar echoes as a function of time. Though echo power and phase in variant fluctuation scales (Doppler frequency) can be easily analyzed via conventional Fourier based methods, it is hard to figure out individual echo properties of targets after so many echoes having mixed to a complex signal, which we obtain from a receiver. The ensemble empirical mode decomposition (EEMD) method of Hilbert-Huang transform (HHT) technique allows fluctuations in variant scales to be separated; it provides an opportunity to study radar echo in variant scales without utilizing any artificial filter. Adopting EEMD method, radar signal as a function of time is decomposed into a finite number of intrinsic mode functions (IMFs) that each is in particular dominant scale. Echoes close to some fluctuation scale are then clustered in IMFs. Echoes come from precipitations at melting layer often contain types of spectra properties that are mixed, and are examined by this scale-clustering technique.

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