



## **Complex Plane Specular Meteor Radar Interferometry**

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This talk presents a solution to the problem of specular meteor radar interferometry cast on the complex plane. This technique is applicable to all meteor radars at the output of the receiver's pulsed Doppler signal processing chain. Specular meteor trail radar echoes are modeled as exponentially decaying sinusoids impinging on a sparse interferometric antenna array. A set of 10 underdense meteor trail radar parameters are estimated using nonlinear least squares optimization of the physical model parameters. Meteor trail spatial locations are determined by estimating all parameters through global optimization of the complex-valued interferometric angle-of-arrival equations. Statistical precision of the estimated meteor radar parameters of Doppler, diffusion coefficient, angle-of-arrival, and height are subsequently characterized by calculation of the full covariance matrix. The determination of statistical uncertainties in the measured parameters is a key innovation in the field, as it lays the groundwork for calculating the statistical precision of the subsequently derived wind field.