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SPACE DEBRIS SYMPOSIUM (A6)
Measurements (1)

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ORBITAL DEBRIS PARAMETER ESTIMATION FROM VERTICAL POINTING RADAR

Abstract

We present results from analysis of space debris data collected by the EISCAT radar at Svalbard. The space debris measurements, approximately 90 hours worth, were made by the EISCAT radar at the end of February 2008 after the Chinese anti-satellite (ASAT) test one year prior. Match function analysis is performed to obtain ranges, range-rate and Signal to Noise Ratio (SNR) from the data set. Setting the time interval between measurements to 0.08 seconds allows the short arc streaks to be fitted to a symmetrical beam pattern for the radar to obtain precise measurements on the Radar Cross Section (RCS). This gives the approximate sizes and mass estimates for the debris particles in addition to estimates on altitude and velocity of the particles. Results are compared to NASA's collision model as well as Space-Track's catalogue of satellites. This process shows that given the constraints of vertical pointing radar with a relatively unknown beam pattern and no tracking ability, one is still able to provide insightful analysis with limited information.