Day to Night Variability of Non-Specular Radar Meteor Trails in Mid-Latitudes

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We present diurnal variability and day to night observations of non-specular radar meteor trails detected with the University of Illinois 50MHz Interferometer Portable Radar System installed near Fort Macon, Atlantic Beach, North Carolina (76°W, 34°N) during the summer of 2001.The UI radar comprises three subsystems: the antenna array, the transmitter and receiver, and computer control and data collection. The antenna array of the UI radar is composed of two side-by-side identical arrays positioned to provide for zonal interferometric measurements and labeled *east* and *west* because of the northward pointing angle of the overall antenna array. The radar was pointed perpendicular to the magnetic field at E-region heights over Wallops Island. Phased beam steering was applied during this experiment to provide an elevation of 16° and an overall half power beam width in azimuth of 3.4° and in elevation of approximately 20°. We studied the diurnal variability of meteor events during the time spanning from 21:00 UT June 26, 2001 through 22:00 UT June 27, 2001. For our day to night studies, we analyzed data from two days: 1) June 26, 2001, from 7:55 to 8:24 UT and from 11:24 to 11:52 UT, and 2) June 27, 2001 from 8:55 through 10:56 UT. Local sunrise is at 9:56 UT. Our analysis of this data set shows that in general, non-specular meteor trails do not show strong day to night variability. We attribute this result to be partly due to the effect of atmospheric winds on trail duration. We repeat a similar analysis with a data set collected from the same location during the summer of 1999. We also analyze the characteristics of these meteor radar reflections.