

RECENT AUTOMATED-SEARCH METEOR RESULTS FROM
ARECIBO 430 MHZ RADAR OBSERVATIONS

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The automated micrometeor search algorithm has now cataloged over 33,000 separate sporadic meteor events seen with the 430 MHz Arecibo Observatory radar over 30 hours of observation time. The results of the new automated technique are compared with previous results, indicating that our current technique is able to detect over 95% of all possible events in the absence of strong sources of radio interference, an improvement over previous techniques (Janches et al. 2000; Mathews et al. 2003). A significant percentage (approximately 15%) of meteor events are observed to (apparently) catastrophically destruct within the beam the terminal event in less than 1 ms. This non-ablative mass deposition process may play an important role in the aeronomy of the upper atmosphere as it apparently produces sub-micron sized particles. We present the meteor parameters obtained from an automatic FFT meteor searching routine and consider the terminal-event destruction of meteoroids and resultant mass deposition as an important factor in the aeronomy of the meteor zone. We also present results on the altitude, speed, and mass distributions of terminal event meteoroids yielding some clues on the physics of the terminal-event including meteoroid interaction with the near 100-km atmosphere and ionosphere.

Janches, D., J. D. Mathews, D. D. Meisel and Q. H. Zhou (2000). "Micrometeor observations using the Arecibo 430 MHz radar." *Icarus* **145**: 53-63.

Mathews, J. D., C. H. Wen, J. F. Doherty, S. J. Briczinski, D. Janches and D. D. Meisel (2003). "An update on UHF radar meteor observations and associated signal processing techniques at Arecibo Observatory." *J. Atmos. Solar Terrestrial Phys.* **65**: 1139-1149.

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