

Technical Page

Proposal Type: Long-term
 General Category: Terrestrial Aeronomy
 Sub-Category: Radar
 Observation Category: Middle-Lower Atmosphere
 Total Time Requested: 120 Hours
 Minimum Useful Time: 8 hours around 6 am

Proposal Title: Micrometeor Observations: Exploring the Solar Wind and Terrestrial Mass Influx Connection

ABSTRACT:

Solar induced variations in interplanetary dust distribution have been predicted and detected by the Ulysses and Galileo spacecraft (Landgraf, 2000). During the years 2002-2004, we tried to obtain AO micrometer data during sunspot maximum when solar wind flow is most vigorous but a subsequently discovered AD converter problem has made data reduction progress difficult and results ambiguous. At present, the solar wind material produced in 2002-2004 is approaching the heliospheric boundary. We propose making UHF radar observations of the AO micrometeor flux in an effort to detect solar wind perturbations that may have been produced on dust particles when they were at large distances from the sun. Over the last two years, we have made substantial improvements in the analysis of AO micrometeors so that even estimates of individual particle density and related parameters are obtained. Use of the AO UHF radar for this study is essential because (a) it is the ONLY radar capable of detecting micron and sub-micron sized particles (Meisel et al, 2002a,b), (b) the UHF radar discloses meteors on highly eccentric orbits (including interstellars) very efficiently, and (c) AO is the only radar for which observations of this type were made at other times in the solar cycle. The AO micrometeor flux shows wide temporal variations particularly at the smallest particle sizes and this study will elucidate the role of the solar cycle in those changes. Newly determined flux inputs can then be obtained which will impact aeronomic observations.

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Remote Observing Request

- Observer will travel to AO
- Remote Observing
- In Absentia (instructions to operator)

Instrument Setup

430 CH receiver 430 CH radar

Atmospheric Observation Instruments:

Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned

430 MHz only