

## **FIRST SATELLITE OBSERVATIONS OF METEORIC SMOKE IN THE UPPER ATMOSPHERE**

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We report the first remote observations of meteoric smoke particles from satellite, by the Solar Occultation For Ice Experiment (SOFIE) onboard the Aeronomy of Ice in the Mesosphere (AIM) platform. Smoke particles are the leading candidate for the nucleation of ice particles that make up noctilucent clouds, however, the role of smoke is a subject of debate because the current understanding of these particles has been derived mostly from theory combined with a few limited ground-based observations. SOFIE measurements are compared to model results which predict the abundance of smoke particles in altitude, latitude, and time. SOFIE and the models are found to agree favorably, indicating smoke particles from roughly 35 to 85 km altitude and a strong seasonal dependence in smoke abundance, which is consistent with meridional transport. These new measurements are important to understanding a variety of other phenomena including mesospheric ion and neutral chemistry, nucleation of polar stratospheric clouds which are critical in ozone hole chemistry, and the long term accumulation of extraterrestrial material in polar ice.

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