Polar Mesospheric Cloud Measurements from the Solar Occultation For Ice Experiment (SOFIE)

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The Aeronomy of Ice in the Mesosphere (AIM) satellite was launched into a circular polar orbit at 600 km altitude on 25 April 2007. The Solar Occultation For Ice Experiment (SOFIE) is one of three science instruments on onboard AIM, and began science observations on 14 May 2007. SOFIE measurements are used to retrieval vertical profiles of temperature, O_3, H_2O, CO_2, CH_4, NO, and polar mesospheric cloud (PMC) extinction at 11 wavelengths from 0.33 to 5 μm. Measurement latitudes cover 65° - 85°S and 65° - 85°N throughout the year. SOFIE offers unprecedented sensitivity to PMCs, and is able to detect clouds that are roughly 100 times dimmer than could be observed by previous satellite instruments. SOFIE PMC measurements are used to determine profiles of particle shape, ice mass density, and particle size. SOFIE provides simultaneous temperature and water vapor measurements extending above 90 km altitude, which are unaffected by PMC interference. This work describes results using observations in the 2007 northern polar summer.