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THE SAGE III TEST OCCULTATION INSTRUMENT: GROUND-BASED OBSERVATIONS FOR SATELLITE VALIDATION

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One of five spectrometer/telescopes built for the Stratospheric Aerosol and Gas Experiment III (SAGE III) satellite project, the Test Occultation Instrument (TOI) has been converted to a ground-based instrument for laboratory and field experiments. The TOI optics contains an 809 x 11 CCD detector array covering a wavelength range of 275 nm to 1030 nm. The TOI has proved to be a valuable asset for the project, being used for pre-launch cross calibration with the flight instruments and as a test device for modifications in the operational software prior to upload to the flight instrument. The development of the TOI field measurement capabilities allows the TOI to be used for ground-based validation of the SAGE III solar and lunar occultation products, in particular O3 and NO2 vertical profiles. Additional measurements include total column estimates of O3, NO2, H2O, and aerosol extinction at multiple wavelengths. This paper presents an overview of the instrument and results of radiometric performance studies from cross calibration experiments as well as atmospheric observations based on both direct sun and twilight zenith sky measurements.