



Nocturnal aerosol optical thickness measured with a sun/moon photometer developed by improving the Prede Sky-radiometer

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Sun photometry to obtain the aerosol optical thickness (AOT) needs the sun. Since the moon must be another source of light instead of the sun during night-time, a moon photometer was developed by improving the Prede POM-02 Sky-radiometer to measure the spectral lunar irradiance. The original POM-02 model has an electric dynamic range of 109 to measure both of direct- and circum-solar radiation. The electronics of POM-02 was upgraded to include a 1011 dynamic range for better performance to measure the direct lunar irradiance at the visible range as well as the sun and sky measurements with a single instrument. A CCD-based position sensor was newly developed to track the moon as well as the sun continuously. The position of the moon/sun is determined with accuracy of better than 0.01° by a real-time processing system using the CCD imager. Test measurements with the improved POM-02 instrument were performed for the half to full moon conditions, and showed a good performance for lunar photometry to obtain the nocturnal AOTs.