

Remote Sensing of Atmospheric and Surface Properties using Hyperspectral satellite Sensors

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Hyperspectral remote sensors from satellite platforms provide high information content on clouds, atmospheric temperatures, moisture, and trace gases profiles. They also provide surface information. In order to retrieve these information from hyperspectral remote sensing data, a fast and accurate radiative transfer model and a robust inversion algorithm are needed. We will describe a Principal Component-based Radiative Transfer Model (PCRTM) and an associated non-linear inversion algorithm. The PCRTM model can provide fast and accurate top of atmosphere high spectral resolution radiance or reflectance spectra from far infrared spectral region to UV-VIS spectral region. The forward model has been used to analyse hyperspectral data such as AIRS, CrIS, IASI, and SCIAMACHY. Examples of retrieval results from some of these satellite sensors will be given.

Keywords: remote sensing, atmospheric profiles, radiative transfer