

Surface Emissivity Retrieved from AIRS

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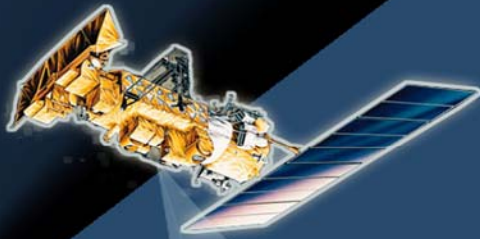
The surface emissivity affects thermodynamic parameters (e.g., surface skin temperature, atmospheric moisture, and temperature) retrieved from satellite infrared (IR) spectral radiance will be addressed. Simulation analyses and retrieval validations demonstrate that surface emissivity plays an important role in retrieval of surface skin temperature and terrestrial boundary layer (TBL) moisture. A retrieval algorithm has been developed to retrieve surface and atmospheric parameters. This algorithm has been applied to NAST I and AIRS hyper-spectral data. Results show appropriate surface skin temperature and emissivity retrieval to be critical for atmospheric profile retrievals of temperature, moisture, and chemical species, since satellite observations such as those from AIRS aboard the AQUA satellite, cover a large variety of surface types. AIRS data are used to demonstrate that a large diversity of surface types is captured with this inversion scheme, indicating surface skin temperature and emissivity information is detected by hyper-spectral remote sensors such as AIRS and IASI. Accurate surface and atmospheric properties retrieved from satellite measurements can greatly enhance benefits realized from usage of such data for NWP and other applications.

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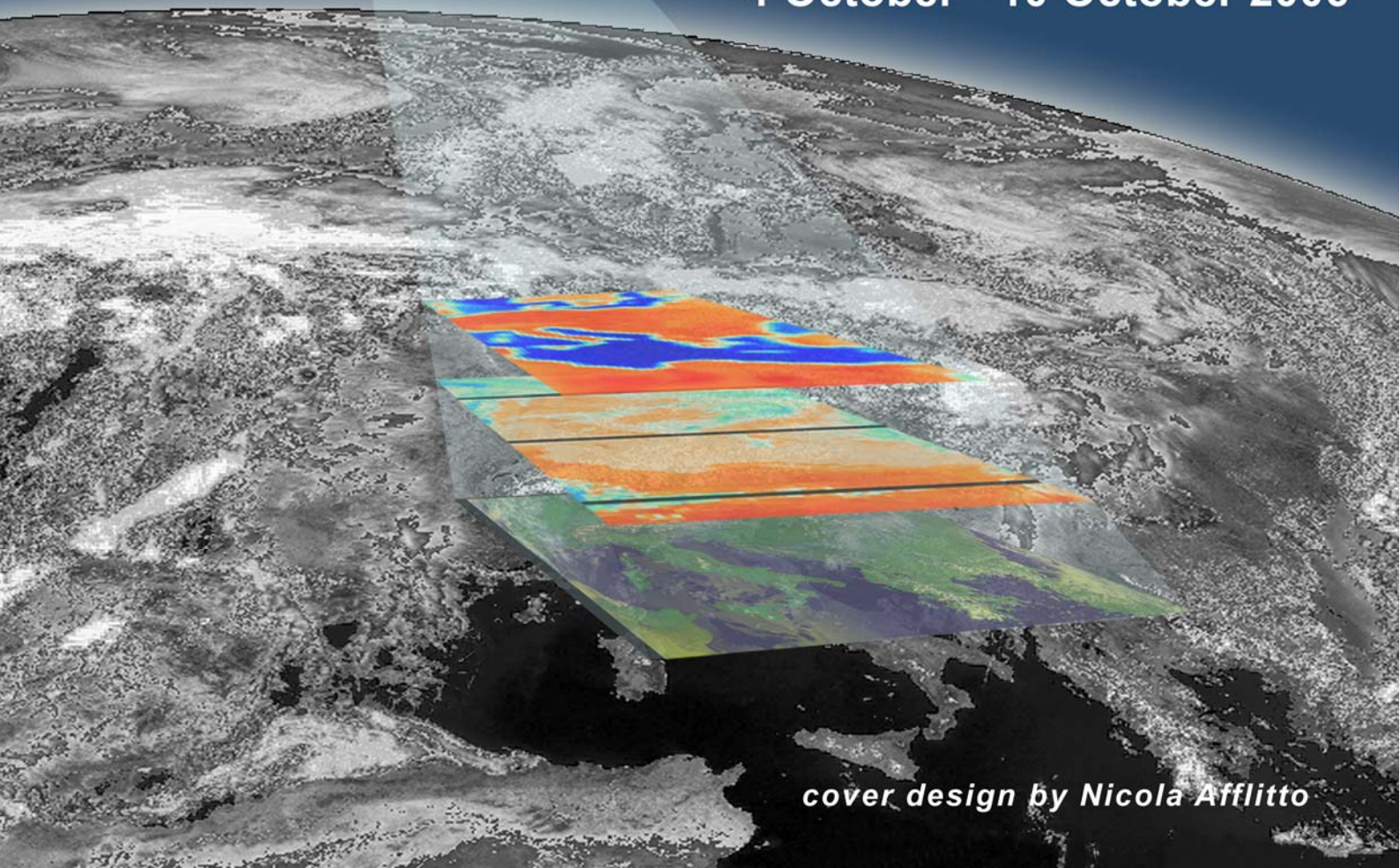
using space-based observations



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