NOAA/NESDIS UPDATES ON OPERATIONAL SOUNCING DATA PRODUCTS AND SERVICES

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Introduction

It is a cooperative effort between the National Oceanic and Atmospheric Administration (NOAA) and the European Organization for the Exploitation of Meteorological (EUMETSAT) to provide and improve the operational meteorological and environmental forecasting and global climate monitoring services worldwide. The NOAA National Environmental Satellite, Data, and Information Services (NESDIS) has been a pioneer in producing and distributing atmospheric sounding data products as a part of its operation for operating a fleet of civilian, Polar Orbiting Environmental Satellites (POES) and providing users and researchers a suite of operational atmospheric and environmental data products. Sounding Data Products are being generated from the advance TRMM Operational Vertical Sounder (ATOVS), onboard NOAA polar orbiting satellites (currently operational NOAA-15 and NOAA-18), and Infrared Atmospheric Sounding Interferometer (IASI) onboard Meteorological Operational Satellite (MetOp)-I. IASI is a state-of-the-art sounding system developed to support Initial Joint Polar-Orbiting Operational Satellite System (IPOES) program and the future missions of the EUMETSAT satellites. Detailed information on the operational products and their applications are also presented.

System Diagram of NOAA Retrieval

- Click Granule in the Granite Map below to Browse the image or
- Click Granule number in the table (Show Granite Table)

Near Real-Time IASI Data Browse

Sequence of Steps of the Retrieval Algorithm

1) A microwave retrieval module which derives cloud liquid water flags and microwave surface emissivity uncertainty.
2) A fast eigenvector regression retrieval for temperature and moisture that is trained using the ECMWF analysis and IASI surface emissivity training data.
3) A cloud clearing module that uses a set of microwave and IR channels to produce the cloud-cleared IR radiance product and reject those cases violating the cloud-clearing requirements.
4) A fast eigenvector regression retrieval for temperature and moisture that is trained using the ECMWF analysis and IASI cloud cleared radiances.
5) The final IR retrieval module, which uses the regression retrieval as an initial solution and produces the final version of the physical retrieval by an iterated regularized least squared minimization.

We start with the temperature retrieval, because temperature is the most linear component of the RTA equation, followed by water vapor, ozone, etc.

All adjustments to the algorithm pertain the first 5 steps.
Optimizations of the parameters involved in the following trace gas retrievals are only minor adjustments.

Global Grids Data

Cloud Cleared Radiances

Retrieval Temperature and Water Vapor at 400 mb

Global Grids Data

Comparison Temperature with ECMWF at 1° latitude