Preliminary validation of the CrIMSS (ATMS/CrIS) physical retrieval approach

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Unified Retrieval (UR)
AER’s UR physical algorithm concept, first applied and tested with DMSP Block 5D3 sensor suite, is used as the basis for the NPOESS CrIS and CMIS EDR algorithms.

Ongoing parallel efforts to validate and improve microwave and infrared spectroscopy (LBLRTM, MonoRTM) and to enhance/tune retrieval approach (and quality control of its product) over wide range of conditions.

Focus on impact of clouds and atmospheric/surface inhomogeneities, treatment of surface emissivity/reflectivity, trace gases and tracking instrumental errors.

Following data is automatically processed and analyzed on daily basis:
- NOAA (AMSU-A and B) (Global)
- EOS AMSU/AIRS (selected regions)
- Future extension to SSMIS (Global)

UR Algorithm components

- First stage microwave (non-linear) physical retrieval
- State classification module
- Microwave and Infrared Linear Inversion
- Convergence and quality control
- \(^2\) test (unphysical state vector elements values removed during inversion)
- Check “distance” from microwave first-guesses (currently not used)

NOAA-16 AMSU-A and B processing

NCEP MRF vs. AMSU mean differences

RAOBs comparison
1 year of global (ocean) cloud free data (8000 quality controlled NOAA-AMSU matchups)

Comparison of AMSU CLW/ precipitation detection with NOAA products

EOS/AMSU-AIRS

NOAA vs. EOS AMSU retrieval

Noise Filtering

Number of cloud formations
High CC contrast regions

AMSU-AIRS temperature retrieval differences

Location: -14.4/-170.7 00z

RAOBS comparison