CrIS and AIRS are high resolution IR and Microwave atmospheric sounders currently flying on the SNPP satellite, and are also scheduled for flight on future NPOESS satellites. CrIS/AIRS have similar sounding capabilities to those of the AIRS/AMSU sounder suite flying on EOS Aqua. The objective of this research is to develop and implement scientifically equivalent AIRS/AMSU and CrIS/AIRS retrieval algorithms with the goal of generating a continuous data record of AIRS/AMSU and CrIS/AIRS level-3 data products with a seamless transition between them in time and space. AIRS/AMSU and CrIS/AIRS retrieved products, and more importantly their intercomparabilities, should show excellent agreement with each other. The currently operational AIRS Science Team Version-6 retrieval algorithm has generated 14 years of level-3 data products. A scientifically improved AIRS Version-7 retrieval algorithm is expected to become operational in 2017. We see significant improvements in water vapor and ozone in Version-7 retrieval methodology compared to Version-6.

We are working toward formalization and implementation of scientifically equivalent AIRS/AMSU and CrIS/AIRS retrieval algorithms to be used for the eventual processing of all AIRS/AMSU and CrIS/AIRS data. The latest version of our retrieval algorithm is Version-6.36, which includes almost all the improvements we want in Version-7. Version-6.28 has been used to process both AIRS and CrIS data for August 2014. This poster compares August 2014 monthly mean Version-6.28 AIRS/AMSU and CrIS/AIRS products with each other, and also with monthly mean products obtained using AIRS Version-6. AIRS and CrIS results using Version-6.36 are presented for April 15, 2016. These results also show improved agreement of Version-6.36 AIRS and CrIS products with each other. Version-6.36 is not yet optimized for CrIS ozone products.

Sample Cloud Free Brightness Temperature Spectrum
AIRS Version-6.36 Channels
CrIS Version-6.36 Channels

Comparison of AIRS Version-6.28 Product with CrIS Version-6.28
AIRS and CrIS surface skin temperature and 700 mb temperature fields match very well over ocean. Currently, CrIS land skin temperatures are somewhat lower than those of AIRS, which leads to correspondingly higher 700 mb temperature over land for CrIS.

Summary
Monthly mean August 2014 Version-6.28 AIRS and CrIS products agree well with OMPS and CERES. AIRS and CrIS Version-6.28 total precipitable water is biased dry compared to AIRS. AIRS and CrIS Version-6.28 water vapor products are both improved compared to Version-6.28. Version-6.36 AIRS and CrIS total precipitable water also shows improved agreement with each other. AIRS Version-6.36 total ozone agrees even better with OMPS than does AIRS Version-6.28, and gives reasonable results during polar winter where OMPS does not generate products.

Analysis of CrIS/ATMS and AIRS/AMSU data using Scientifically Equivalent Retrieval Algorithms A13D-0285
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