



Status of High Spectral Resolution IR for Advancing Atmospheric State Characterization and Climate Trend Benchmarking: A Period of Both Opportunity Realized and Squandered

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The past decade, and even the four years since the last IRS, has significantly furthered our understanding of the potential of high spectral resolution infrared measurements for crucial weather and climate applications. This potential is based on advances in the maturity of analyses of new observations and on technological advances in (1) spectrometer development, especially Fourier Transform Infrared (FTIR) performance and robustness; (2) array detector size and capabilities; (3) mechanical cooling options; and (4) new technologies for on-orbit verification and testing.

Some of this potential has been successfully realized through the successes of AIRS on NASA Aqua (2002 launch), IASI on EUMETSAT Metop (2006 launch), and CrIS on the new NASA/NOAA Suomi NPP platform (28 October, 2011 launch). However, these successes make the case for a vast array of unrealized potential. What could have been the beginning of a truly golden age for reaping the benefits of FTIR is being squandered, or at the very least is not proceeding at a pace warranted by societal needs. Opportunities for advanced geosynchronous sounding with huge economic benefits from earlier warnings of incipient severe weather and opportunities for creating climate benchmarks for valuable input toward establishing a global energy policy have been throttled by lack of resolve, especially in the US. Fortunately, Europe has plans to implement the advanced geostationary sounder on the Meteosat Third Generation (MTG) in 2019 and China has plans for a more limited version on FY4 in 2015. Hopefully the opportunities that have been squandered will become just a limited (but painful) and relatively short delay.

This Union talk will summarize some of the technical considerations of this situation, with special emphasis on new developments for establishing a climate benchmarking observatory consistent with the US National Research Council Decadal Survey Tier 1 CLARREO mission that includes direct SI traceability based on fundamental on-orbit standards. The talk will also touch on opportunities for advancing our operational observing capabilities in the US.