



Reprocessing long-term satellite instruments for climate monitoring and reanalyses

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Climate monitoring requires generation of long-term satellite data products using satellite retrieval algorithms. Alternatively, satellite radiance data can be assimilated into numerical climate models to generate comprehensive reanalysis data products for climate monitoring and research. However, calibration and data consistency have been a major issue in producing reliable satellite and reanalysis climate products. Many long-term satellite climate products and earlier-generation reanalyses suffer from spurious climate jumps and variability induced by satellite transition and calibration-related instrument changes. Future satellite and reanalysis climate products require satellite data to be well calibrated so that instrument-related time-varying intersatellite biases are removed before they are used for climate analysis and data assimilation. Instrument characteristics such as frequency response functions are also required to be well described for accurately simulating radiances by radiative transfer models in reanalyses. For these purposes, NOAA/NESDIS is reprocessing and recalibrating radiance data from the NOAA and DMSP polar-orbiting satellite series. The instruments being investigated include MSU/AMSU/ATMS, SSU, HIRS, AVHRR, and SSM/I, etc. In this presentation, we will report the current status on the recalibration/reprocessing effort of the 30 years of MSU/AMSU radiance data using simultaneous nadir overpass. We will also introduce the recent effort in NESDIS/STAR in correcting the CO₂ gas leaking problem in the SSU intercalibration process. Challenges and issues during the MSU/AMSU/SSU recalibration process will be discussed. NOAA/NCEP is planning a CFSRR (Climate Forecast System Reanalysis and Reforecast) reanalysis project for climate monitoring. The current collaborations between NCEP and NESDIS in assimilating the reprocessed MSU and SSU radiance data in supporting the CFSRR project will be discussed.