Title: Towards a Consensus AVHRR Reflectance Calibration

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The Advanced Very High Resolution Radiometer (AVHRR), which flies on the NOAA Polar Orbiting Environmental Satellites (POES), has proven to provide a unique data-set for multi-decadal satellite climate studies. The AVHRR provides global data with a spatial resolution of 4 km with 4 times per day sampling. The three thermal channels (3.75, 11 and 12 mm) have on board calibration but the three solar reflectance bands (0.63, 0.86 and 1.6 mm) do not. Various methods have been developed to address the lack of onboard calibration for the solar reflectance bands. As many studies have shown, the accuracy of the AVHRR reflectance calibration is one of the major drivers in the errors of some of the key climate parameters measured by the AVHRR (NDVI, aerosol, cloud). Unlike the thermal calibration that varies rapidly, the solar reflectance calibration is a smooth function of time and described by a few coefficients for each channel on each satellite.

Unfortunately, the multiple methods for providing a post-launch correction for the AVHRR often do not agree within the expected and needed accuracy. The goal of this proposal is to undertake activities to develop a consensus on the historical AVHRR reflectance calibration and its uncertainty. Now is the optimal time to conduct this work. With launch of imagers with onboard calibration, there exists new data contemporaneous with the AVHRR that can be used to generate more accurate calibration of the current AVHRR instruments and test methods used to calibrate historical AVHRR data. In addition, the various groups that develop AVHRR reflectance calibrations, have expressed a desire to meet and tackle the lack of consensus among the results. This desire was expressed in person by most groups at the recent AMS Radiation Conference in Madison, Wisconsin. In addition, the GEWEX Radiation Panel chair (Bill Rossow) has also expressed his support and has stated that GEWEX will help coordinate these activities.

The major goal of this work is to hold two workshops whereby the various AVHRR reflectance calibration groups can meet, exchange ideas and attempt to reach consensus. To aid this process, we seek funds for hosting the workshop and for a scientist to conduct the bulk of the analysis of the various calibration results. The secondary goal of this workshop is to finalize the preliminary historical NESDIS AVHRR reflectance calibration method that is based on MODIS. This proposal speaks directly the Scientific Stewardship mission of producing authoritative long-term records. Once the consensus calibration is achieved, these improvements can be implemented into the level 1b archive at NCDC or be made publicly assessable and used by any AVHRR application that derives its own reflectance calibration.