NASA CALIBRATION AND CHARACTERIZATION IN THE NPOESS PREPARATORY PROJECT (NPP)

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The National Polar-Orbiting Environmental Satellite System (NPOESS) Preparatory Project (NPP) is a bridging mission between the NASA Earth Observing System (EOS) and the joint Department of Defense (DOD), NOAA, and NASA NPOESS program. For the broader Earth Science community, NPP will continue the remote sensing datasets initiated by the NASA EOS Terra, Aqua, and Aura missions. In addition to providing new technology to NPP, NASA has instituted a focused program in the calibration and characterization of the NPP instruments in an effort to ensure and assess that data from those instruments are of equal or better quality than those provided by EOS. This program is managed from NASA's Code 429 NPP Project Office and spans the pre-launch to post-launch timeframes. Prelaunch, the program has incorporated the direct participation of members of NASA's NPP Project Science Group (PSG) including the Visible Infrared Imager Radiometer Suite (VIIRS) Ocean Science Team (VOST), the NPP Science Team (ST), and the NPP Instrument Characterization Support Team (NICST) in the following areas: instrument hardware and software reviews, instrument test plan and test procedure reviews, independent test data analysis, assessment of test data quality required for the production of Sensor Data Records (SDRs) and Environmental Data Records (EDRs), and preparation of and participation in the formulation of post-launch activation plans, validation plans, and spacecraft orbital calibration maneuvers. In addition, NPP ST, PSG, and NICST members have provided extensive on-site data analysis support during the thermal vacuum calibration and characterization of VIIRS. Post-launch, the program will incorporate the members of the NPP Science Team (ST), NICST, and NASA's Science Data Segment (SDS) Product Evaluation and Analysis Tool Elements (PEATEs) in a number of areas including independent assessments of the on-orbit calibration of NPP instruments and the resulting science quality of NPP SDRs and EDRs, on-orbit satellite instrument comparisons, and suggestions for algorithm improvements to the NPOESS Interface Data Processing Segment (IDPS). Using the VIIRS instrument as an example, a broad range of calibration and characterization activities have been planned based on NASA's experience with the MODIS instruments on EOS Terra and Aqua. This includes analysis of specific subsets of VIIRS data acquired not only from Earth views, but also from on-board calibrators, from lunar views, and from instrument telemetry. This presentation provides an overview of the wide range of NASA NPP calibration and characterization activities undertaken as part of NASA's independent evaluation of the quality of the

operational SDRs generated by the IDPS and their ability to be used to produce EDRs of sufficiently high quality to continue climate data records from EOS.