NOAA ROSES Semi-Annual Report

Reporting Period: March 2021 – August 2021 (2nd report)

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Project Title: GOES High cadence Operational Total Irradiance (GHOTI)

Executive Summary (1 paragraph max)

Analysis of the GOES-R series SPS instrument on EXIS to create a high-cadence proxy for Total Solar Irradiance and use the EUVS-C instrument to create a high-cadence MgII index record. These will be combined to create a high-cadence solar model spectra collection.

Progress toward FY20 Milestones and Relevant Findings (with any Figs)

We have created orbital and temperature corrections for the GOES16 and GOES17 SPS detectors. Once we remove some obvious instrumental artifacts and irradiance calibrate the SPS signal using SORCE/TSIS TSI measurements, we will have the first high-cadence (4 hz) solar TSI proxy record from 2017-2021.

We presented our project goals at the European Geophysical Union (EGU21-10348), and initial results will be presented at the Fall AGU 2021 conference.

Plans for Next Reporting Period

Our data calibration goals for the next reporting period are

1) Correct for spacecraft (e.g., pointing maneuvers) and instrumental artifacts (e.g., noise spikes) for GOES16 and GOES17 SPS data,
2) Use 24-hour publically available SORCE/TSIS TSI measurements to determine and apply a long-term degradation correction for each detector,
3) Irradiance calibrate the SPS signal to TSI using the publically available 6-hr SORCE/TSIS measurements,
4) Determine the accuracy of our calibrations using the real-time SORCE/TSIS TSI measurements from the internal instrument databases at CU/LASP.