***Recalibration and Re-evaluation of the SORCE SIM Data Record***

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The SIST efforts funded are to support the development of improved SORCE SIM solar spectral irradiance (SSI) datasets. Based largely on the recent advances made in spectral characterization and calibration measurement facilities, we performed many parallel, full-spectrum characterizations and calibrations specific to the SORCE SIM optical components and performance parameters. These included direct measurements of SORCE flight witness detectors and optical materials or similar TSIS flight candidates. These were analyzed and, in favorable cases, incorporated in updated calibration values to potentially reduce the overall systematic uncertainty of the SORCE SIM absolute SSI scale (especially in the ultraviolet and infrared) and provide a tie to the future TSIS SIM data record. The results showed that while some of these inputs were subtle in the performance changes (e.g. temperature coefficient updates), others have larger effects (e.g. diffraction and transmission corrections) that required further refinements to address quantitative uncertainty estimates.

With regard to longer term spectral and temporal stability corrections we were successful in implementing several unique approaches to begin to quantify the solar exposure related degradation correction sensitivity in the early mission SORCE SSI record. The approach involved refining the solar exposure ratios to address changes in the common spectral degradation factor degradation (exponential in exposure time) with the mission time. This was completed by constraints in the ratio of several integrated bands between SIM A and SIM B comparisons as well as a global constraint of the full integrated SIM irradiance to the SORCE TIM TSI over the mission. Overall this approach provided insight into the validity of some assumptions that are made in the two-channel degradation tracking methodology and the generation of a temporal and spectral function to correct the long-term solar exposure degradation. Efforts reported here focus on understanding the constraints on the early mission degradation and stability corrections and begin to quantify the differences in the measurement of the spectral degradation for long-term degradation corrections and the two-channel instrument model deficiencies.