

Of Straying Photons, Shiny Apertures, and an Inconstant Solar Constant – Advances in TSI Radiometry

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The SORCE mission has boosted new developments in TSI radiometry and calibration facilities. Most if not all of those developments were and still are targeted at finding and eliminating the cause for the lower “solar constant” which the TIM on SORCE measures with respect to everybody else. Various explanations have been put forward by the instrument teams to explain the offset between different TSI radiometers. Thanks to the dual traceability chain of the PREMOS radiometers we were able to identify a scale difference between the TRF (NIST) and the WRR (PMOD/WRC) as a probable cause for the observed offset.

We will discuss the process which eventually led to a new agreement on the level of the TSI and explain why the scale offset had gone unnoticed before the TRF has been built. We will present our efforts at PMOD/WRC to resolve the discrepancies with new calibration facilities and procedures as well as with new radiometer designs.