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How well do we know the incoming solar infrared radiation?

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The solar spectral irradiance (SSI) has been identified as a key climate variable by the Global Climate Observing System (Bojinski et al. 2014, Bull. Amer. Meteor. Soc.). It is of importance in the modelling of atmospheric radiative transfer, and the quantification of the global energy budget. However, in the near-infrared spectral region (between 2000-10000 cm-1) there exists a discrepancy of $\sim$7% between spectra measured from the space-based SOLSPEC instrument (Thuillier et al. 2015, Solar Physics) and those from a ground-based Langley technique (Bolseé et al. 2014, Solar Physics). This same difference is also present between different analyses of the SOLSPEC data. This work aims to reconcile some of these differences by presenting an estimate of the near-infrared SSI obtained from ground-based measurements taken using an absolutely calibrated Fourier transform spectrometer. Spectra are obtained both using the Langley technique and by direct comparison with a radiative transfer model, with appropriate handling of both aerosol scattering and molecular continuum absorption. Particular focus is dedicated to the quantification of uncertainty in these spectra, from both the inherent uncertainty in the measurement setup and that from the use of the radiative transfer code and its inputs.