Solar EUV irradiance: where have we been and where are we going?

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Recent satellite measurements, such as those made by the TIMED Solar EUV Experiment (SEE), have finally filled the "EUV Hole". Or have they? The solar EUV spectral irradiance is a primary energy source for the upper atmosphere and variability in the solar EUV drives geospace variability. We present an overview of historical and recent measurements of the solar EUV spectral irradiance with a discussion of their uncertainties and limitations, in particular with regard to accuracy, measurement cadence, and spectral resolution. We also present an overview of the state of solar EUV irradiance models, with comparisons to measurements. We make an assessment of the current understanding of solar EUV and how future measurements and model improvements will address outstanding issues.