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The TSI Instruments – What’s Old, What’s New, and What’s Next

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What is the Earth’s incoming energy, that is, the value of the total solar irradiance (TSI) powering the entire Earth’s climate system on an absolute scale? How accurate are the instruments providing these data? How stable are they on climate-relevant timescales? How well can the 43-year spaceborne TSI measurement record from over a dozen instruments be put into a single time-series composite for the climate- and solar-research communities? How can that composite be extrapolated to historical times using other solar-activity proxies via reconstructions? How do these historical-reconstruction models differ from each other, and how well do they agree with the current measurements? And what is the future of those measurements?