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Data Fusion of Total Solar Irradiance Composite Time Series Using 40 years of Satellite Measurements: First Results

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Since the late 70's, successive satellite missions have been monitoring the sun's activity, recording total solar irradiance observations. These measurements are important to estimate the Earth's energy imbalance, i.e. the difference of energy absorbed and emitted by our planet. Climate modelers need the solar forcing time series in their models in order to study the influence of the Sun on the Earth's climate. With this amount of TSI data, solar irradiance reconstruction models can be better validated which can also improve studies looking at past climate reconstructions (e.g., Maunder minimum). Various algorithms have been proposed in the last decade to merge the various TSI measurements over the 40 years of recording period. We have developed a new statistical algorithm based on data fusion. The stochastic noise processes of the measurements are modeled via a dual kernel including white and coloured noise. We show our first results and compare it with previous releases (PMOD,ACRIM, ...).