Three Solar Cycles of Total Solar Irradiance Observations: How TSI is behaving differently and what can we learn about solar variability?

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The three available TSI composites are discussed in order to highlight the reasons for the main differences. The uncertainty related to corrections needed for the PMOD composite will discussed in some detail, mainly to assess its representativeness for solar variability. The correlation with the open magnetic field of the Sun will be discussed. The open field is obviously not directly influencing TSI, but it is good measure of the overall strength of solar activity which does influence solar irradiance on all time scales; this correlation can be used to reconstruct TSI in the past using reconstructions of the open field from e.g. cosmogenic isotopes. Furthermore, comparison with the results of a 3-component proxy model with PSI and the MgII index, separated in a long and short-term time series, is used to show interesting differences of the three solar cycles.