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Solar forcing recommendations for CMIP7

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Back in 2017, solar forcing recommendations for the 6th round of the Coupled Model Intercomparison Project (CMIP) were provided which covered, for the first time, all relevant solar irradiance and energetic particle contributions. Since then, this dataset has been extensively used in climate model experiments and has been tested in various intercomparison studies. Further, new datasets have been come available. An International Space Sciene Institute (ISSI) Working Group has been established to review these recent achievements in order to define the strategy for building a revised solar forcing dataset for the upcoming 7th round of CMIP. After receiving community feedback on this strategy, a preliminary histrorical solar forcing dataset for CMIP7 has been recently constructed. Major changes with respect to CMIP6 include the adoption of the new Total and Spectral Solar Irradiance Sensor (TSIS-1) solar reference spectrum for solar spectral irradiance and an improved description of top-of-the-atmosphere energetic electron fluxes, as well as their reconstruction back to 1850 by means of geomagnetic proxy data. Solar irradiance varaibility in the reference forcing dataset is based on historical reconstructions generated with a preliminary version of the new empirical NASA NOAA LASP (NNL) Solar Spectral Irradiance Version 1 model, NNLSSI1. In adition, an alternative solar irradiance dataset, based on SATIRE, is provided for sensitivity experiments. In this talk we will discuss the applied modifications with respect to CMIP6 and their implication for climate modeling. Ongoing activities on solar forcing uncertainty quantification and the contruction of future solar forcing scenarios will also be summarized.

Solicited or Contributed

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