

Interactive comment on “Solar Forcing for CMIP6 (v3.1)” by Katja Matthes et al.

Katja Matthes et al.

kmatthes@geomar.de

Received and published: 7 July 2016

Dear Dr. Luening,

We appreciate your interest for our manuscript. Since the CMIP6 modeling exercise starts in 1850, the time series for the solar forcing is provided exactly for this period. Our intention is to provide a best estimate solar forcing data set that will be used by all CMIP6 modeling groups in order to test how well the models can reproduce observations.

We agree that it is important to also look further into the past. This is actually done within the PMIP (Paleoclimate Modeling Intercomparison Project) Exercise (Kageyama et al., GMDD 2016). PMIP has an experiment in Tier 1, which means highest priority, covering the last 1000 years and therefore also the Medieval Warm Period and the Little Ice Age. The solar forcing provided for PMIP will be coordinated with our

C1

solar forcing, in order to ensure consistency. In addition, as part of the PMIP "Tier 2" experiments, a variety of solar forcing reconstruction will be provided covering uncertainty in base data (14C and 10Be isotope records), as well as different assumptions for long-term changes, to reflect uncertainties in the magnitude of secular variations (Jungclauss, et al., manuscript in preparation for Clim. Past).

Our 1000-year solar forcing time series is meant solely for sensitivity experiments in order to understand physical mechanisms for internal natural climate variability such as a potential synchronization of North Atlantic climate variability by the 11-year solar cycle (Thiéblemont et al., 2015) in the atmosphere-ocean system. It avoids on purpose any long-term trend in solar activity, and should therefore not be used for historical model simulations and/or solar forcing reconstructions.

We will include a comment and a link to the PMIP publication (Kageyama et al., 2016) in our revised manuscript.

Best regards,

Katja Matthes and Bernd Funke

Kageyama, M., Braconnot, P., Harrison, S. P., Haywood, A. M., Jungclauss, J., Otto-Bliesner, B. L., Peterschmitt, J.-Y., Abe-Ouchi, A., Albani, S., Bartlein, P. J., Brierley, C., Crucifix, M., Dolan, A., Fernandez-Donado, L., Fischer, H., Hopcroft, P. O., Ivanovic, R. F., Lambert, F., Lunt, D. J., Mahowald, N. M., Peltier, W. R., Phipps, S. J., Roche, D. M., Schmidt, G. A., Tarasov, L., Valdes, P. J., Zhang, Q., and Zhou, T.: PMIP4-CMIP6: the contribution of the Paleoclimate Modelling Intercomparison Project to CMIP6, Geosci. Model Dev. Discuss., doi:10.5194/gmd-2016-106, in review, 2016.

Thiéblemont, R., Matthes, K., Omrani, N.-E., Kodera, K., and Hansen, F.: Solar forcing synchronizes decadal North Atlantic climate variability, Nature Commun., 6, 8268, doi:10.1038/ncomms9268, 2015.