

# Design for the last millenium run

You will find on this page information about the experiment design for the PMIP4 [Last Millenium](#) experiment.

Please make sure to read the [Associated publication](#) before setting up your experiments or using the output data, and read any *how-to* sections associated with specific boundary conditions.

Get in touch with the following people if you have questions:

<a href="#">Johann Jungclaus</a>	Scientific questions
<a href="#">Jean-Yves Peterschmitt</a>	Technical questions or missing data

## Associated publication

**The PMIP4 contribution to CMIP6 - Part 3: The last millennium, scientific objective, and experimental design for the PMIP4 past1000 simulations**, Jungclaus, J. H., Bard, E., Baroni, M., Braconnot, P., Cao, J., Chini, L. P., Egorova, T., Evans, M., González-Rouco, J. F., Goosse, H., Hurtt, G. C., Joos, F., Kaplan, J. O., Khodri, M., Klein Goldewijk, K., Krivova, N., LeGrande, A. N., Lorenz, S. J., Luterbacher, J., Man, W., Maycock, A. C., Meinshausen, M., Moberg, A., Muscheler, R., Nehrbass-Ahles, C., Otto-Bliesner, B. I., Phipps, S. J., Pongratz, J., Rozanov, E., Schmidt, G. A., Schmidt, H., Schmutz, W., Schurer, A., Shapiro, A. I., Sigl, M., Smerdon, J. E., Solanki, S. K., Timmreck, C., Toohey, M., Usoskin, I. G., Wagner, S., Wu, C.-J., Yeo, K. L., Zanchettin, D., Zhang, Q., and Zorita, E., *Geosci. Model Dev.*, 10, 4005-4033, [doi:10.5194/gmd-10-4005-2017](https://doi.org/10.5194/gmd-10-4005-2017), 2017.

## Specifications

	PMIP4-CMIP6 specifications
PMIP4-CMIP6 name	<b>past1000</b>
Astronomical parameters	Time varying, following <i>Berger 1978</i> and <a href="#">Schmidt et al., 2011</a> Use the <a href="#">table provided by Gavin Schmidt for PMIP3</a>
Trace gases	<b>CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub></b> = <i>time varying</i> , <a href="#">Meinshausen et al., CMIP6 GMD special issue</a> The CMIP6 greenhouse gases forcing data set covers the period 0 to 2014. Data sets can be downloaded from: <a href="http://www.climatecollege.unimelb.edu.au/cmip6">http://www.climatecollege.unimelb.edu.au/cmip6</a> . The data sets will be made available also via <a href="https://pcmdi.llnl.gov/search/input4mips/">https://pcmdi.llnl.gov/search/input4mips/</a> <b>CFC</b> = 0 <b>O<sub>3</sub></b> = for models without interactive ozone chemistry, we suggest that O <sub>3</sub> modulation is derived in a similar way from the modulation of the UV part of the solar spectrum as in the historical simulations (c.f. <a href="#">Matthes et al., CMIP6 GMD special issue 2016</a> )
Solar activity	<b>Time varying</b>

<b>PMIP4-CMIP6 specifications</b>	
Ice sheets	Same as in CMIP6 piControl
Topography and coastlines	Same as in CMIP6 piControl
Volcanic activity	<p>Time varying sulphur injections eVolv2k (doi:<a href="https://doi.org/10.1594/WDCC/eVolv2k_v2">10.1594/WDCC/eVolv2k_v2</a>, described by <a href="#">Toohey and Sigl, 2017</a>) for models with interactive aerosol chemistry. For models that need aerosol optical properties as forcing, these are produced by the EVA (<i>Easy Volcanic Aerosol</i>) module (<a href="#">Toohey et al., 2016</a>) using the eVolv2k data set as input.</p> <p>A tar file including the eVolv2k input data, the EVA module, scripts and instructions, can be downloaded here: <a href="#">eva_evolv2k_pmip4_v2.1.tgz</a> (112 Kb) (You can check the downloaded package with: md5sum eva_evolv2k_pmip4_v2.1.tgz ⇒ e634d266a850fc6cc03463037b187693)</p>
Aerosols	The treatment of dust and aerosols in the past1000 simulations should be the same as the one used in piControl. There is no time-varying dust forcing available for the last millennium
Vegetation	The methodology to represent vegetation should be the same as for the CMIP6 piControl simulation
Land Use forcing	<p>Land-Use/Land-cover change forcing is the same as for the <a href="#">historical CMIP6 forcing</a>, which has been extended to cover 850 CE to 2015 CE.</p> <p>The CMIP6 Land Use Harmonization data set has been developed as part of the Land Use Model Intercomparison Project LUMIP (<a href="#">Lawrence et al</a>) and can be downloaded from the <a href="#">LUMIP web site</a></p>

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