# The PMIP4 special issue

## Description

**Paleoclimate Modelling Intercomparison Project phase 4 (PMIP4) (CP/GMD inter-journal SI)**

The Paleoclimate Modelling Intercomparison Project (PMIP) has been set up to provide a mechanism for coordinating paleoclimate modelling and model evaluation activities, to understand the mechanisms of climate change and the role of climate feedbacks in these changes. PMIP is now in its fourth phase: PMIP4. Five PMIP4 experiments have been proposed within the framework of the CMIP6 exercise. Other periods and sensitivity experiments are also planned to assess climate sensitivity, changes in hydrology, long-term trends and interannual to millennium variability.

This special issue is devoted to the description of the design of the PMIP4 experiments, of data syntheses to which model results can be compared, and to papers analysing single or multi-model results from PMIP4 and CMIP6 experiments. Papers can either be submitted to:

- **GMD**: model and simulation descriptions, data syntheses in support of the experimental design or of model-data comparisons
  - Editor(s): GMD topical editors
  - Coordinator: Masa Kageyama
  - Go to GMD PMIP4 SI
- or **CP**: in-depth analyses, multi-model analyses, model-data comparisons
  - Editor(s): Masa Kageyama, Pascale Braconnot, Sandy Harrison, Johann Jungclaus, Bette Otto-Bliesner, and Marie-France Loutre
  - Go to CP PMIP4 SI

## PMIP4 experiments

This section has both PMIP4-CMIP6 experiments and non-CMIP6 experiments

See also the PMIP4 experimental design section of this web site

- **The PMIP4 contribution to CMIP6 – Part 1: Overview and over-arching analysis plan**, Kageyama, M., Braconnot, P., Harrison, S. P., Haywood, A. M., Jungclaus, J. H., 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., Geosci. Model Dev., 11, 1033-1057, doi:10.5194/gmd-11-1033-2018, 2018.
- **The PMIP4 contribution to CMIP6 – Part 2: Two interglacials, scientific objective and experimental design for Holocene and Last Interglacial simulations**, Otto-Bliesner, B. L., Braconnot, P., Harrison, S. P., Lunt, D. J., Abe-Ouchi, A., Albani, S., Bartlein, P. J., Capron, E., Carlson, A. E., Dutton, A., Fischer, H., Goelzer, H., Govin, A., Haywood, A., Joos, F., LeGrande, A. N., Lipscomb, W. H., Lohmann, G., Mahowald, N., Nehrbass-Ahles, C., Pausata, F. S. R., Peterschmitt, J.-Y., Phipps, S. J., Renssen, H., and Zhang, Q., Geosci. Model Dev., 10, 3979-4003,

doi:10.5194/gmd-10-3979-2017, 2017.

- **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, 2017.

- **The PMIP4 contribution to CMIP6 – Part 4: Scientific objectives and experimental design of the PMIP4-CMIP6 Last Glacial Maximum experiments and PMIP4 sensitivity experiments**, Kageyama, M., Albani, S., Braconnot, P., Harrison, S. P., Hopcroft, P. O., Ivanovic, R. F., Lambert, F., Marti, O., Peltier, W. R., Peterschmitt, J.-Y., Roche, D. M., Tarasov, L., Zhang, X., Brady, E. C., Haywood, A. M., LeGrande, A. N., Lunt, D. J., Mahowald, N. M., Mikolajewicz, U., Nisancioglu, K. H., Otto-Bliesner, B. L., Renssen, H., Tomas, R. A., Zhang, Q., Abe-Ouchi, A., Bartlein, P. J., Cao, J., Li, Q., Lohmann, G., Ohgaito, R., Shi, X., Volodin, E., Yoshida, K., Zhang, X., and Zheng, W., Geosci. Model Dev., 10, 4035-4055, doi:10.5194/gmd-10-4035-2017, 2017.

  Supplementary material

- **Transient climate simulations of the deglaciation 21–9 thousand years before present (version 1) – PMIP4 Core experiment design and boundary conditions**, Ivanovic, R. F., Gregoire, L. J., Kageyama, M., Roche, D. M., Valdes, P. J., Burke, A., Drummond, R., Peltier, W. R., and Tarasov, L., Geosci. Model Dev., 9, 2563-2587, doi:10.5194/gmd-9-2563-2016, 2016.

- **The Pliocene Model Intercomparison Project (PlioMIP) Phase 2: scientific objectives and experimental design**, Haywood, A. M., Dowsett, H. J., Dolan, A. M., Rowley, D., Abe-Ouchi, A., Otto-Bliesner, B., Chandler, M. A., Hunter, S. J., Lunt, D. J., Pound, M., and Salzmann, U., Clim. Past, 12, 663-675, doi:10.5194/cp-12-663-2016, 2016.

  Supplement (Haywood et al, CP, 2016)

- **The DeepMIP contribution to PMIP4: experimental design for model simulations of the EECO, PETM, and pre-PETM (version 1.0)**, Lunt, D. J., Huber, M., Anagnostou, E., Baatsen, M. L. J., Caballero, R., DeConto, R., Dijkstra, H. A., Donnadieu, Y., Evans, D., Feng, R., Foster, G. L., Gasson, E., von der Heydt, A. S., Hollis, C. J., Inglis, G. N., Jones, S. M., Kiehl, J., Kirtland Turner, S., Korty, R. L., Kozdon, R., Krishnan, S., Ladant, J.-B., Langebroek, P., Lear, C. H., LeGrande, A. N., Littler, K., Markwick, P., Otto-Bliesner, B., Pearson, P., Poulsen, C. J., Salzmann, U., Shields, C., Snell, K., Stärz, M., Super, J., Tabor, C., Tierney, J. E., Tourte, G. J. L., Tripati, A., Upchurch, G. R., Wade, B. S., Wing, S. L., Winguth, A. M. E., Wright, N. M., Zachos, J. C., and Zeebe, R. E., Geosci. Model Dev., 10, 889-901, doi:10.5194/gmd-10-889-2017, 2017.

- **The penultimate deglaciation: protocol for PMIP4 transient numerical simulations between 140 and 127 ka, version 1.0**, Menviel, L. et al, Geosci. Model Dev., 2019, https://dx.doi.org/available_soon

## Model descriptions

## Simulation descriptions

## Data syntheses

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