THE LAST GLACIAL MAXIMUM CLIMATE OVER EUROPE: HIGH RESOLUTION SIMULATIONS.

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Comparison of climate simulations within the Palaeoclimate Modelling Intercomparison Project (PMIP) for the Last Glacial Maximum (LGM, 21 kyr BP) with consistent climate reconstructions established from pollen records have underscored the differences between the simulated and reconstructed hydrological cycle and temperatures. Western Europe is the region where the largest discrepancy betwen pollen-based estimates and model results is observed. The PMIP model results underestimate the large cooling inferred from pollen data, especially in winter. Similar to the temperature estimates, the models simulate conditions drier than today but not as dry as the data indicate.

Several causes can account for such a discrepancy. In particular, it can be related to the imposition of prescribed Sea-Surface Temperatures, especially over the Mediterranean Basin, and to the lack of accurate vegetation reconstructions in the models. But the coarse resolution used in the PMIP experiments may certainly also explain a part of these differences.

The aim of this study is to investigate the impact of the model resolution through the use of a variable grid model. A suite of palaeoclimate modelling experiments have been performed, using the LMDZ.3.3 atmospheric general circulation model. It uses an irregular grid with a higher spatial resolution centered on Paris, where the horizontal grid spacing is of about 60 km. We present climate simulations for the present and the LGM. The model results are compared to the PMIP independent palaeoclimatic pollen-based databases on the one hand and with regular lower resolution climate simulations using the same model on the other.