



## Arctic climate over the past millennium: origin of warm episodes

Elisabeth Crespin (1), Hugues Goosse (1), Thierry Fichefet (1), Svetlana Dubinkina (1), and Sami Hanhijärvi (2)

(1) Georges Lemaître Centre for Earth and Climate Research, Earth and Life Institute, Université catholique de Louvain, Louvain-la-Neuve, Belgium, (2) Department of Environmental Sciences, University of Helsinki, Finland

The origin of the climate variability in the Arctic region over the past millennium is still not well understood. Recent studies highlight important differences between model simulations and reconstructions based on proxy data. In order to study the causes of these differences, the information provided by the climate model of intermediate complexity LOVECLIM and a recent data-base of high-resolution Arctic proxies brought together by the Arctic2k group are combined using a data assimilation method. This method consist in a particle filter applied over a relatively large ensemble of simulations in which, at each step, the members of the ensemble are resampled according to their capacity to reproduce the available data. We particularly focus our analysis on the origins of the warm periods in the Arctic during the past millennium, the associated spatial patterns of anomalies, the involved mechanisms and the relative contributions of the internal variability and external forcings to the temperature changes.