



## **Solar forcing and climate variability in the North Atlantic during the last millennium: comparison between models and reconstructions**

J. Servonnat (1), M. Khodri (2), P. Yiou (1), J. Guiot (4), and S. Denvil (3)

(1) LSCE, Physics, Gif sur Yvette, France (jerome.servonnat@lsce.ipsl.fr), (2) Institut de Recherche pour le Développement, Bondy, France, (3) Institut Pierre Simon Laplace, Jussieu, Paris, France, (4) Centre Européen de Recherche et Enseignement en Géosciences de l'Environnement (CEREGE), UMR 6635, Aix en Provence, France

Studying the climate of the last millennium allows replacing the present climate change in a long term context. Since it is a relatively well-documented period, it provides an interesting base to assess the secular variability of the climate, free of anthropogenic greenhouse gas influence. Considering this, the climate of the last millennium is likely to have been driven by natural forcings, such as major volcanic eruptions or solar variability.

We present here the results of the simulations performed with the IPSLCM4v2 climate model for the French ANR ESCARSEL project (reconstruction of the climate of the last millennium). In order to understand the role of the solar variability during this period, we have forced the model with a reconstruction of the Total Solar Irradiance since 1000AD (Crowley et al., 2000).

The results are compared with various reconstructions based on proxy data, from the hemispheric to the continental scale. A new reconstruction of the temperature in Europe since 600AD (annual April to September mean, based on tree rings data) has been achieved within the ESCARSEL project. This dataset provides the possibility to compare the spatial response of the model to the solar forcing with the corresponding temperature patterns recorded in the proxys.

As a first step we present the results on the long term variability, before focusing on selected periods to assess the spatial behaviour of the model to different value of the total solar irradiance.

Crowley et al. 2000, Causes of climate change over the past 1000yrs, Science 289, 270