



The Millennium climate simulations with large ensemble of GCM

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We report the status of a new GCM project to simulate the climate evolution of the last millennium using a perturbed ensemble of a variant of UK Met Office's Unified Model. The simulation project is a part of a new EU project called *Millennium*, the aim of which is to obtain an improved reconstruction of the European climate during the last millennium using the state of the art technology. This goal will be achieved by collecting new proxy data throughout Europe with latest equipments, and integrating all available information to date. We GCM subgroup run a variant of HadCM3, one of the most comprehensive general circulation models, for the entire globe. This will allow us to systematically reconstruct the Earth's climate evolution, and to better understand the climate system. Several primary numerical models will be run on a new in-house PC cluster. The cluster was specifically designed to execute the long integration for the whole millennium using multiple processing units for multiple sub-domains. We will also employ an Internet-wide infrastructure of volunteer PCs, which were integrated through the facility of the *ClimatePrediction.net* (CPDN) project. The current CPDN system is based on the BOINC software infrastructure, and a large ensemble of perturbed global GCM models are distributed to home and office PCs over the world. For the millennium GCM, the volunteer computer will simulate the climate change for few hundreds of years per session, and all the results will be collected to the central server. We expect that the combination of the two systems will bring a unprecedented scale of ensemble of climate simulations to quantify the uncertainty in the variability of Earth's climate in the last millennium.