



Using paleoclimate proxy-data to select an optimal realisation in an ensemble of simulations of the climate of the past millennium.

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We present a technique that combines in an optimal way model results and proxy-data time series in order to obtain states of the climate system consistent with model physics, reconstruction of past radiative forcing and proxy records. To achieve this goal, we select among an ensemble of simulation covering the last millennium performed with a low-resolution 3-D climate model the one that minimise a cost function. This cost function measures the misfit between model results and proxy records. In the framework of the tests performed here, an ensemble of 30 to 40 simulations appears sufficient to reach correlations between model results and proxy time series that have the same magnitude as the correlations between proxy time series and measurement over the instrumental era, illustrating the skill of the method at a reasonable cost. A first application of the method is proposed by analysing the temperature evolution at the hemispheric scale resulting from the procedure. Although this scale is not directly constrained by the method, the agreement between model results and reconstruction is very good. Those favourable results suggest promising perspectives for the method.