A model-based global hindcast of millennial and orbital-scale climate variability of the past 408 ka

AXEL TIMMERMANN[1], TOBIAS FRIEDRICH[2,] LAURIE MENVIEL[3]

[1]IPRC, SOEST, University of Hawaii, USA, axel@hawaii.edu
[2]IPRC, SOEST, University of Hawaii, USA, tobiasf@hawaii.edu
[3]CCRC, University of New South Wales, Sydney, Australia, l.menviel@unsw.edu.au

Late Pleistocene global Climate variability is a superposition of externally forced orbital-scale variations and internally generated millennial-scale fluctuations. To better understand the nature, timing and pattern of these anomalies in paleo-climate records, we developed a novel paleo-climate hindcast of the past 408 ka that captures both types of variability. We blend an externally forced transient earth system model simulation, which responds to orbital forcing, greenhouse gas and ice-sheet changes, with an empirical estimate of the Dansgaard-Oeschger continuum. The latter is obtained as the product of a normalized North Atlantic SST record from the Iberian Margin region and the millennial-scale regression patterns derived from an transient Dansgaard-Oeschger hindcast simulation. We will demonstrate the skill of this paleohindcast through comparison with a plethora of high-resolution temperature and hydroclimate paleo records. We will further discuss the possibility to use this earth system model-based paleo-hindcast to develop or improve age models of paleo-climate records.