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CLIMATE AND LOW LATITUDE WATER CYCLE VARIATIONS OVER THE LAST 300 ka USING ICE CORE RECORDS AND iLOVECLIM INTEGRATION

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The Quaternary is characterized by a succession of glacial and interglacial periods recorded in various climatic archives from high to low latitudes. Antarctic ice cores provide high latitude climate reconstruction from water isotopes as well as global proxy records such as greenhouse gas concentrations. Within global tracers, δ18O of O_2 or δ18Oatm is a quite complex tracer which reflects global variations of the low latitude water cycle and vegetation changes. The last two terminations (TI $\sim$ 20-11 ka and TII $\sim$ 136-128 ka) are already well documented and display a high resolution δ18Oatm signal with large amplitude changes, whereas the changes are smaller and poorly documented for the TIII (around 245 ka).
Here we display new δ18Oatm data over the last 300 ka on the Dome C ice core in order to compare the δ18Oatm dynamics over the last three terminations. The new high resolution δ18Oatm data covering the Termination III confirm the smaller δ18Oatm amplitude changes compared to TI and TII. Moreover, the δ18Oatm changes of TIII appear to be divided in several steps.
The δ18Oatm trapped in Dome C ice cores also shows strong similarity with the 65°N summer insolation and the precession signal on orbital timescales as well as with the δ18Ocalcite measured in the Asian speleothems, suggesting a link with the monsoon dynamics. However, the quantitative interpretation of δ18Oatm is limited by our knowledge of past oxygen fluxes. We present here the first step toward a more quantitative interpretation of δ18Oatm variations through the use of the iLOVECLIM intermediate complexity model with a new vegetation module CARAIB (Warnant et al., 1994; Otto et al., 2002; Laurent et al., 2008; Dury et al., 2011). Through considering more plant functional types (PFTs) and more accurate biosphere productivity variations than the previous module, CARAIB will be helpful to quantify the impact of the biosphere changes on the δ18Oatm.