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Investigating the climatic impact of precession changes during glacial times

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Several publications have tackled the issue of the impact of precession changes on the climate of the Holocene (e.g. Braconnot et al, 2008, Marzin & Braconnot, 2009). These studies have shown a major impact on the African and Asian monsoon systems. During the last glacial period, the presence of the northern hemisphere ice-sheets and the lower greenhouse gases might have changed the sensitivity of the climatic system to precession.

Here we use the Atmosphere-Ocean General Circulation model IPSL_CM5 to simulate the climate at the beginning and end of MIS4, corresponding to a maximum and minimum of precession respectively. We investigate hydrological changes in monsoons and in the summer rainfall over South Africa. For that region, available micro-charcoals record show a positive correlation between fire activity and precession changes. These variations are assumed to reflect changes in summer precipitation (Daniau et al, in revision). We use our results from the IPSL simulations, completed by vegetation simulations with the LPJ-SPITFIRE model off-line, to test this hypothesis.