



## **Relative role of El Niño events in the mid-Holocene global energetic changes**

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It has been shown that El Niño events contribute to discharge the warm pool excess of energy out of the tropical Pacific. In a different climate, in which the climatological Walker and Hadley circulations are modified—as it is likely to be the case in the future—, the ocean heat content in the tropical Pacific is altered, which might have an effect on the El Niño amplitude and/or frequency and thereby on the role of El Niño on the energy redistribution. The mid-Holocene (6ka BP) offers a good example of changes in the distribution of solar energy, since the equator-pole gradient is different from today. We analyze long stable simulations of 6ka BP and the pre-industrial era and discuss the mean and El Niño-related energy transports in the two climates. Comparing heat fluxes and transports during El Niño years and “normal” years, we show that the role of heat pump played by the tropical Pacific is reduced in the mid-Holocene in our simulations, during both normal years and El Niño years. We demonstrate that this is not a direct response to the radiative forcing but this is further amplified by changes in the large scale circulation. Furthermore, we analyze the relative contribution of El Niño events in the energy redistribution in each climate and show that it is reduced in the mid-Holocene compared to the pre-industrial.