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Meridional energy transport in a AOGCM simulation for the last interglacial (125ka BP) and the last glacial inception (115ka BP)

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It is known that the equator-to-pole transport of energy is one of the most important factors for mid-latitude weather and thus climate. Thereby the transport of heat and momentum by transient and stationary eddies in the atmosphere play an important role in the overall meridional energy transport, beside heat transport by ocean circulation. This transport is influenced by the meridional temperature gradient and thus by the meridional insolation gradient. Periods like the last interglacial and the last glacial inception are characterized by considerable different insolation gradient during the winter seasons compared to today.

Three quasi equilibrium simulations with the fully coupled atmosphere ocean general circulation model ECHO-G with respect to their equator-to-pole energy transport are compared: one for the last interglacial (125ka BP), one for the last glacial inception (115ka BP) and one for the preindustrial period. Analysis are focused on the influence of heat and momentum eddy fluxes on storm activity over the North Atlantic. Changes of the zonal mean climate show differences of the strength of the Hadley and Ferrel cell. Differences of eddy heat and momentum fluxes between the three simulations indicate changes of the stromtracks in the northern Hemisphere winter.