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Obliquity control on meridional temperature gradient in the southern hemisphere: a model-data comparison

F Vimeux (1,2), **M Kageyama** (2), R Uemura (3), N Yoshida (4), J Jouzel (2), O Watanabe (3)

(1) IRD/ UR Great Ice, Paris, France, (2) LSCE/IPSL, CE Saclay, Gif-sur-Yvette, France (3) National Institute of Polar Research, Tokyo, Japan, (4) Tokyo Institute of Technology, Yokohama, Japan

The Vostok record of deuterium excess (Vimeux et al., 1999 and 2002) suggests that the annual mean insolation gradient between low and high southern latitudes, and, therefore, obliquity, is an important control for the meridional sea surface temperature gradient in the southern hemisphere. Here, we present the deuterium excess history at Dome Fuji, located in the Atlantic sector of Antarctica, suggesting a similar importance of obliquity in controling the southern hemisphere meridional SST gradient. In parallel, we present the results from three simulations of the climate of the last 240 ky performed using the CLIMBER2.3 Earth System Model of Intermediate Complexity. These simulations show that although there are strong precession and obliquity signals in the SST time series for a given latitude, the precession signal disappears from the time series of the meridional SST gradient. Therefore, this confirms the interpretation of the Vostok and Dome Fuji deuterium excess records.