



Understanding differences in East Antarctic ice cores during interglacials

Louise Sime (1), Tom Bracegirdle (1), Eric Wolff (2), Valérie Masson-Delmotte (3), Kevin Oliver (4), and Julia Tindall ()

(1) British Antarctic Survey, Ice Cores, Cambridge, U.K. (lsim@bas.ac.uk), (2) Laboratoire des Sciences du Climat et de l'Environnement (IPSL-CEA-CNRS-UVSQ, UMR8212), Gif-sur-Yvette, France, (3) The Open University, Milton Keynes, U.K. , (4) University of Bristol, Bristol, U.K.

Stable isotope ratios of oxygen and hydrogen in the Antarctic ice record provide invaluable proxy temperature information. Conversions between of isotope observations in ice core and past site temperatures have traditionally been based on geographical observations of the spatial isotope-temperature relationship. The relationship is suggested to be uniform ($\pm 10\%$) over the East Antarctic and constant with time ($\pm 20\%$), for climates cooler than present day.

For warmer climates, an analyse of several long (340 kyr) ice core records from across East Antarctica, alongside input from isotopic GCM modelling, indicated that for warmer interglacial periods, conversions vary between different East Antarctic ice core sites (Sime *et al.* 2009). Results indicate that the East Antarctic water isotopes tend to be less sensitive to temperature changes during warmer climates. This indicates that previous temperature estimates from interglacial climates are likely to be too low. The available evidence is consistent with Antarctic interglacial temperatures that were significantly (more than 6°C) higher than present day.

A fuller understanding of why variable ice core isotopic sensitivity occurs *i.e.* why some East Antarctic ice core sites record larger isotopic fluctuations than others, will help in constraining uncertainty on Antarctic interglacial climate reconstructions (Masson-Delmotte *et al.*, 2010). We present results from a new detailed multi-model analysis (Sime and Bracegirdle, in prep). This analysis helps explain observed similarities, and differences, between the East Antarctic Plateau ice core sites during interglacial climate changes (Sime *et al.* 2009, Masson-Delmotte *et al.*, 2010).

V. Masson-Delmotte *et al.* (2010) *A comparison of the present and last interglacial periods in six Antarctic ice cores* **Clim. Past Discuss.**, 6, 2267-2333

L. C. Sime, E. Wolff, K. Oliver, J. Tindall (2009) *Evidence for warmer interglacials in East Antarctic ice cores* **Nature**, 462, 342-345

L. C. Sime and T. Bracegirdle *Understanding differences in East Antarctic Plateau ice cores during interglacials* **JGR - Atmos** (in prep).