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Orbital and millenial antarctic climate variability over the last 800 000 years

J. Jouzel (1), V. Masson-Delmotte (1), O. Cattani (1), G. Dreyfus (1), S. Falourd (1), G. Hoffmann (1), J. Nouet (1), S. Johnsen (2, 3), M. Leuenberger (4), H. Oerter (5), F. Parrenin (6), G. Raisbeck (7), J. Schwander (4), R. Souchez (8), E. Selmo (9), J.P. Steffenssen (2), B. Stenni (10), B. Stauffer (4), T. Stocker (4), M. Werner (11) and E. Wolff (12).

(1) LSCE/IPSL, CEA-CNRS- UVSQ, CE Saclay, 91191 Gif-sur -Yvette, France, (2)Department of Geophysics, Juliane Maries Vej 30, University of Copenhagen, DK-2100, Copenhagen, Denmark, (3) Science Institute, University of Reykjavik, Dunhaga 3, Reykjavik 107, Iceland, (4) Physics Institute, University of Bern, Sidlerstrasse 5, CH-3012 Bern, Switzerland, (5) Alfred Wegener Institute for Polar and Marine Research (AWI), D27515, Bremerhaven, Germany, (6) Laboratoire de Glaciologie et Géophysique de l'Environnement, CNRS, BP96, 38402, St Martin d'Hères, France, (7) CSNSM/IN2P3/CNRS, Bat 108, 91405 Orsay, France, (8) Département des Sciences de la Terre et de l'Environnement, Université Libre de Bruxelles, Bruxelles, Belgique, (9) Dept. of Earth Sciences, University of Parma, Parma, Italy, (10) Dept. of Geological, Environmental and Marine Sciences, University of Trieste, Trieste, Italy, (11) Max-Planck-Institute for Biogeochemistry, Jena, Germany, (12) British Antarctic Survey, High Cross, Madingley Road, Cambridge, CB3OET, UK

The EPICA (European Project for Ice coring in Antarctica) Dome C drilling in East Antarctica has now been completed reaching back a depth of 3266 m close to the bedrock. We will present and discuss the detailed isotopic deuterium record (delta D), a proxy of temperature change spanning the entire ice core with a 55 cm resolution. This continuous climate record now extends back to Marine Isotope Stage (MIS) 20.2 ~ 800,000 years ago, but there are concurrent signs or either stretching or mixing of the ice for the deepest 60 m of the core which makes the climatic interpretation problematic for earlier periods. From a series of new experiments performed with an atmospheric General Circulation Model implemented with water isotopes, we derive that antarctic surface temperatures were up to ~ 5°C warmest than the Holocene (MIS 5.5 and 9.3) and down to 10 °C coldest for the coldest glacial periods (MIS 2), with

relatively homogeneous changes over East Antarctica over the last 3 climatic cycles. We will discuss both millenial scale changes and the change of pacing about 430,000 years ago which is fully confirmed and suggest a link between this pacing and long term obliquity and annual mean local insolation changes