



The EPICA Dome C time scale EDC2 compared to time scales from polar ice cores and marine sediment cores

F. Parrenin(1), J.-M. Barnola(1), J. Jouzel(2), K. Kawamura(3), F. Remy(4), C. Ritz(1), J. Schwander(5), M. Siegert(6), O. Watanabe(7), E. Wolff(8)

(1) Laboratoire de Glaciologie et Géophysique de l'Environnement, Grenoble, France. (2) Laboratoire des Sciences du Climat et de l'Environnement, Gif-Sur-Yvette, France. (3) Scripps Institution of Oceanography, University of California, San Diego, USA. (4) Laboratoire d'Etudes en Géophysique et Océanographie Spatiales, Toulouse, France. (5) Physics Institute, University of Bern, Bern, Switzerland. (6) Bristol Glaciology Center, Bristol, UK. (7) National Institute of Polar Research, Tokyo, Japan. (8) British Antarctic Survey, Cambridge, England.

For the climatic interpretation of ice core records from Dome Concordia (central East Antarctica), a precise chronology is required. At low accumulation sites such as Dome C, the annual layer counting is not feasible and therefore we developed a glaciological method, combining an ice flow model and an accumulation model based on isotope measurements. For recent periods, this chronology can be tested with independent and accurate control age points. But for older periods, the only possible test is to compare it with chronologies from other Quaternary records. Here we compare the EDC2 chronology with chronologies from the Dome Fuji and Vostok ice cores, that have also been obtained by glaciological modelling. For the last 60 kyr, these chronologies are in very good agreement. But for older periods, in particular marine isotope stage 5.5, there are significant differences, showing that some hypotheses made in the glaciological models are not valid. We will review these hypotheses and suggest possible improvements. Before 400 kyr BP, EPICA Dome C is the only available ice core record, and the comparison is only possible with marine record. We will show that EDC2 compare well with the chronologies of these records, except for Marine Isotope Stage 13, 500 kyr ago. We will suggest possible explanations for this disagreement.