



Time-scale synchronization among EDC, EDML and TD ice cores (Antarctica) by volcanic stratigraphies.

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In the framework of the TALDICE project (TALos Dome Ice CorE), a deep ice core has been drilled on a peripheral dome of East Antarctica. The perforation at Talos Dome (159°11' E 72°49'S 2315 m a.s.l.) reached 1620 m during the 2007-2008 austral summer, covering a period of about 250 kyr. A reliable high-resolution synchronisation of the TD volcanic stratigraphy with the well dated EPICA DC and EPICA DML ice cores is a basic tool for the construction of a reliable timescale and will be a powerful tool to discover whether related climatic events in different sectors of the Antarctic continent occurred at the same time or if there was an offset for the same event in different sites.

In this optic, a FIC (Fast Ion Chromatography) system (coupled to a CFA – Continuous Flow Analysis setup) was used to reconstruct the paleo-volcanic record at this site as was already done for the two EPICA cores with very high resolution (ranging from less than 1 to about 3.5 cm per sample).

Here we report the results of the synchronisation among the TD and the EDC and EDML ice-cores via individuation of synchronous volcanic events for the last 40 kyr.

Several isochronous volcanic events were identified by the comparison of the volcanic stratigraphies and these signatures will be an helpful tool in carrying on a fine-tuning of the pure glaciological model of the TD timescale. Low resolution accumulation rates at TD site for the last deglaciation were then derived from the comparison of couples of volcanic events using the EDC3 agescale. These accumulation rates were then compared to those derived via glaciological modelling showing a very good agreement.

This kind of volcanic synchronisation was already carried out for the two EPICA ice cores and for the Vostok and EPICA-DC cores. Once this comparison will be fully available, it will be possible to synchronize these 4 archives and to extend the peak to peak comparison to other Antarctic ice cores. Furthermore the comparison of several paleorecords of volcanic eruptions will be a powerful tool to point out whether the volcanic events involved the whole Antarctic continent or were just regional scale phenomena.