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EDML-EDC timescale synchronisation for the last Glacial-Interglacial cycle via volcanic signatures matching.

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In the framework of the EPICA project (European Project for Ice Coring in Antarctica), two deep ice cores have been drilled on the East Antarctic Plateau. The perforation at Dome C (EDC - 75˚06'S, 123˚23'E, 3233 m a.s.l., Pacific/Indian sector) reached 3260 m (few meters from the bedrock) in January 2005, covering a period of about 900 kyr, while the drilling at Kohnen Station (EDML - 75˚00'S, 00˚04'E, 2892 m a.s.l., Atlantic sector) reached the bedrock during the 2005/06 season. These two drilling sites have been chosen by EPICA because of the different paleoclimatic information that can be inferred from the ice core study. EDC ice core is providing the longest record from an ice core, expanding our knowledge of past climatic cycles evolution beyond MIS11. On the other hand, EDML will provide information on the relationship between Northern and Southern hemispheres via atmospheric and deep oceanic circulation, because of its geographical location facing the Southern Atlantic Ocean. A reliable high-resolution synchronisation of the stratigraphies of the two ice cores is basic for the construction of a common EDC/EDML timescale and will be a powerful tool to discover whether related climatic events in two different sectors of the Antarctic Plateau occurred at the same time or if there was an offset for the same event in the two 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 the two sites with very high resolution (ranging from less

than 1 to about 3.5 cm per sample). Here we report the results of the synchronisation between the two EPICA ice-cores via individuation of synchronous volcanic events for the whole last glacial-interglacial cycle. Due to the diffusion of sulphate peaks in the deepest part of the EDML ice core (this phenomenon has been already observed in the bottom ice of EDC core) only a few volcanic signatures are visible in the Eemian and in the first part of the last glacial period with respect to the high number of volcanic signatures still clearly visible in the same period of EDC core. This means for our comparison a huge drawback because several signals are not present in EDML core while they are well preserved in the EDC core. Anyway the synchronisation of the two ice cores via volcanic matching still remains a powerful and helpful tool to carry out reliable ice-cores dating.