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# Synchronisation of the EDML and EDC ice cores for the last 52 kyr by volcanic signature matching

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Abstract. A common time scale for the EPICA ice cores from Dome C (EDC) and Dronning Maud Land (EDML) has been established. Since the EDML core was not drilled on a dome, the development of the EDML1 time scale for the EPICA ice core drilled in Dronning Maud Land was based on the creation of a detailed stratigraphic link between EDML and EDC, which was dated by a simpler 1D ice-flow model. The synchronisation between the two EPICA ice cores was done through the identification of several common volcanic signatures. This paper describes the rigorous method, using the signature of volcanic sulfate, which was employed for the last 52 kyr of the record. We estimated the discrepancies between the modelled EDC and EDML glaciological age scales during the studied period, by evaluating the ratio *R* of the apparent duration of temporal intervals between pairs of isochrones. On average *R* ranges between 0.8 and 1.2 corresponding to an uncertainty of up to 20% in the estimate of the time duration in at least one of the two ice cores. Significant deviations of *R* up to 1.4–1.5 are observed between 18 and 28 kyr before present (BP), where present is defined as 1950. At this stage our approach does not allow us unequivocally to find out which of the models is affected by errors, but assuming that the thinning function at both sites and accumulation history at Dome C (which was drilled on a dome) are correct, this anomaly can be ascribed to a complex spatial accumulation variability (which may be different in the past compared to the present day) upstream of the EDML core.

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