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Volcanic synchronisation of the EPICA-DC and TALDICE ice cores for the last 42 kyr BP

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An age scale synchronisation between the Talos Dome and the EPICA Dome C ice cores was carried on through the identification of several common volcanic signatures for the last 42 kyr. Using this tight stratigraphic link we transferred the EDC age scale to the Talos Dome ice core producing a new age scale for the last 12 kyr. We estimated the discrepancies between the modeled TALDICE-1 age scale and the new one during the studied period, by evaluating the ratio R of the apparent duration of temporal intervals between pairs of isochrones. Except for a very few cases, 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. At this stage our approach does not allow us unequivocally to find out which of the models is affected by errors, but, taking into account only the historically known volcanic events, we found that discrepancies up to 200 years appears in the last two millennia in the TALDICE-1 model, while our new age scale shows a much better agreement with the volcanic absolute horizons. Thus, we propose for the Talos Dome ice core a new age scale (covering the whole Holocene) obtained by a direct transfer, via our stratigraphic link, from the EDC modelled age scale by Lemieux-Dudon et al. (2010).