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Identification and dating of the Mono Lake excursion in lava flows from the Canary islands.

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The Mono Lake geomagnetic excursion was defined from the study of lacustrine sections from Western North America [Denham, 1974; Liddicoat et al., 1979]. The proposed age for this excursion reported in the literature changed in time since the first observation and a debate was even very recently opened about the reliability of the dating at the original section at Wilson Creek. In ice cores, a peak in the production of cosmogenic isotopes is clearly observed about 7 ka after the peak associated to the Laschamp excursion. This younger peak, attributed to the Mono Lake occurs between the millennial climatic cycles 7 and 6 (Dansgaard-Oeschger cycles), around 34 kyr in the most recent Greenland ice age model. In addition, in other places, this excursion is described by an intensity low with only very rarely an associated directional shift, questioning the global character of this excursion.
We present a coupled paleomagnetic and dating investigation conducted on four different lavas from the island of Tenerife (Spain) on the basis of preliminary K/Ar dating. From a paleomagnetic point of view, one of these sites is characterized by a direction largely deviated from the one calculated on the basis of an axial geocentric dipole field. The paleointensity values, determined using Thellier and Thellier method and the PICRIT03 set of criteria, is very low, about 8 μT. Two other sites are slightly deviated from the GAD value, in particular with lower inclinations. Paleointensity determinations from these lavas do not yet have a statistical significance and need to be completed but the first results indicate a value around 20 μT. Finally, the last site has a direction consistent with the GAD values and no reliable paleointensity determinations could be obtained so far.
The preliminary K/Ar dating are now completed by Ar/Ar dating and their combination yield an average age of about 32 ka $\pm$ 2 ka for the four outcrops, not statistically distinguishable one from another. This age is, within the uncertainties, consistent with 33.5 to 34.5 ka distribution of the 10Be peak (centered at 34 ka) in NGRIP core.
The directional deviation observed at these sites coupled with a first absolute dating of this excursion indicates that it can constitute an accurate chronostratigraphic tie point for many geological and climatic studies, similarly to the Laschamp excursion. In addition, the different directions and intensities obtained from the four sites with statistically similar ages imply a short duration for this excursion (shorter than the age uncertainty).