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Mono Lake Excursion in Cored Sediment from the Eastern Tyrrhenian Sea

Joseph Liddicoat (1), Marina Iorio (2), Leonardo Sagnotti (3), and Alberto Incoronato (4)

(1) Department of Environmental Science, Barnard College, Columbia University, NY, NY 10027 USA (jcl31@columbia.edu), (2) Istituto per l'Ambiente Marino Costiero, CNR, Calata Porta di Massa, Porto di Napoli, 80133 Naploi, IT, (3) Istituto Nazionale di Geofisica e Volcanologia, Via di Vigna Murata, 605, 1-00143 Roma, IT, (4) Dipartimento di Scienze della Terra, Universita degli Studi di Napoli "Federico II", Largo S. Marcellino 10, 80138, Napoli, IT

A search for the Laschamp and Mono Lake excursions in cored marine and lacustrine sediment younger than 50,000 years resulted in the discovery of both excursions in the Greenland Sea (73.3˚ N, 351.0˚ E, Nowaczyk and Antanow, 1997), in the North Atlantic Ocean (62.7˚ N, 222.5˚ E, Channell, 2006), in Pyramid Lake in the Lahontan Basin, NV, USA (40.1˚ N, 240.2˚ E, Benson et al., 2008), and in the Black Sea (43.2˚ N, 36.5˚ E, Nowaczyk et al., 2012). The inclination, declination, and relative field intensity during the Mono Lake Excursion (MLE) in the Black Sea sediment matches well the behaviour of the excursion in the Mono Basin, CA, in that a reduction in inclination during westerly declination is soon followed by steep positive inclination when declination is easterly, and relative field intensity increases after a low at the commencement of the excursion (Liddicoat and Coe, 1979). A large clockwise loop of Virtual Geomagnetic Poles (VGPs) at the Black Sea when followed from old to young patterns very well the VGP loop formed by the older portion of the MLE in the Mono Basin (Liddicoat and Coe, 1979).

We also searched for the MLE in cored sediment from the eastern Tyrrhenian Sea (40.1˚ N, 14.7˚ E) where the age of the sediment is believed to be about 32,000 years when comparing the susceptibility in the core with the susceptibility in a nearby one that is dated by palaeomagnetic secular variation records, Carbon-14, and numerous tephra layers in the Tyrrhenian Sea sediment (Iorio et al., 2011). In the Tyrrhenian Sea core, called C1067, closely spaced samples demagnetized in an alternating field to100 mT record a shallowing of positive inclination to 48˚ that is followed by steep positive inclination of 82˚ when declination moves rapidly to the southeast. The old to young path of the VGPs in C1067 forms a narrow counter-clockwise loop that reaches 30.3˚ N, 30.8˚ E and that is centered at about 55˚ N, 15˚ E. Although descending to a latitude that is more southerly and is about 120˚ to the east, the VGP loop in the Tyrrhenian Sea is similar to the counter-clockwise one that occurred at the terminus of the MLE in the Mono Basin (Denham and Cox, 1971; Denham, 1974; Liddicoat and Coe, 1979; Liddicoat, 1992).