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The Brunhes–Matuyama transition in central Italy lacustrine deposits

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A 60-m-deep continental core has been drilled into a Pleistocene lacustrine succession encompassing the Brunhes–Matuyama boundary from the Sulmona tectonic basin (central Italy). The lacustrine deposits consist of a low-energy distal facies bearing a large number of tephras sourced from the peri-Tyrrhenian, ultra-potassic volcanic complexes located ∼100 km westward of the basin.
Basing on preliminary chronologic constraints provided by Ar/Ar datings and tephrochronology, the sediment accumulation rates are estimated in the order of ∼0.2-0.3 mm/yr, thus making the Sulmona succession one of the highest-resolution potential records of the Brunhes–Matuyama transition.
The magnetic mineralogy is quite homogeneous, likely consisting of dominant magnetite with scattered occurrence of greigite. The concentration of para- and ferromagnetic minerals in sediments, as documented by susceptibility measurements, shows slight variations that we correlate to climatic oscillations. On the whole a complete glacial-interglacial-glacial cycle is recognizable in the cored succession and it is ascribed to the MIS20–MIS18 interval.
Paleomagnetic investigations on discrete samples documented the B–M transition shortly after the onset of the MIS19 interglacial stage. A larger stratigraphic interval has been then sampled by means of u-channels and measured at 1-cm spacing, with the aim to recover a high-resolution record of the polarity transition. The data show drastic changes in paleomagnetic directions along a ∼6-m-thick core section. According to the preliminary interpretation, the B–M transition should occur in the uppermost ∼2 m of this stratigraphic interval and it is preceded by a normal polarity interval, whose meaning is presently under investigation.