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Integrated chronostratigraphy of early Middle Miocene sediments from DSDP site 372 (western Mediterranean)

H. Abdul Aziz (1), K. Kuiper (2), F.J. Hilgen (2), S. M. Iaccarino (3), E. Turco (3), F. Lirer (4), A. Di Stefano (5), L. M. Foresi (6)

(1) Dept. of Earth and Environmental Sciences, Ludwig-Maximilians-Universität, Munich, Germany (haziz@geophysik.uni-muenchen.de / Phone: + 49-89-21804207), (2) Dept. of Earth Sciences, Utrecht University, Utrecht, the Netherlands, (3) Dipt. di Scienze della Terra, Università di Parma, Italy, (4) IAMC-CNR-Geomare, Napoli, Italy, (5) Dipt. di Scienze della Terra, University of Catania, Italy, (6) Dipt. di Scienze della Terra, University of Sienna, Italy

An accurate age model with a reliable magnetostratigraphy is still lacking for the early part of the middle Miocene. Here we present an integrated magneto- and biostratigraphic framework for middle Miocene sediments from the western Mediterranean DSDP site 372. The accuracy of this framework is tested using radio-isotopic dating of volcanic ash layers found in this site.

Thermal demagnetization of discrete samples revealed a weak paleomagnetic signal. Nevertheless, a characteristic low-temperature component with dual polarities could be distinguished. The resultant magnetostratigraphy is correlated to the geomagnetic polarity time scale (GPTS) ranging from C5Br up to C5ABn.

Detailed biostratigraphic analysis showed the presence of several bioevents, including the astronomically dated *Sphenolites heteromorphus* (LCO). The ages of the bioevents were determined by interpolation of the GPTS ages of Cande and Kent (1995) resulting in an age of 13.48 Myr for *Sphenolites heteromorphus*. However, this age is 170 kyr younger than the astronomically tuned age of 13.65 Myr in Ras il Pellegrin on Malta.

To determine whether this age discrepancy is due to inaccurate GPTS ages, we performed $^{40}Ar/^{39}Ar$ dating on feldspar of two volcanic ash layers. Single crystal analyses yielded low signals, and analytical uncertainties are large due to relatively high noise and background levels. Multigrains experiments are heterogeneous in age, but

we assumed that the youngest age population might approach the “best” possible age estimate. These “best” age estimates suggest that the GPTS of CK95 is too old by at least 110 kyr, therefore implying that the age of bioevent *Sphenolites heteromorphus* must be even younger than 13.48 Myr. This seems unlikely and therefore, we must conclude that these radio-isotopic age estimates do not provide sufficient accurate information for unambiguous correlation of the middle Miocene DSDP 372 magnetostratigraphy to the GPTS.