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Dating climatic oscillations recorded by Romanian loess: a magnetic approach

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Magnetic susceptibility of loess-paleosol sequences in the temperate northern hemisphere has successfully recorded the glacial-interglacial paleoclimatic fluctuations of the Quaternary (e.g. Maher&Thompson, 1999, Evans&Heller, 2003). Our results from several loess sections from the lower Danube plain and Black sea shore have shown that rock-magnetic properties of loess-paleosol deposits display variations similar to those recorded by loess sections from China, Central Asia and Central-Eastern Europe. We are proposing a new approach for dating these sections using the dynamic programming method (Lisiecki & Lisiecki, 2002). Using this method, each magnetic susceptibility record from our loess sections was correlated with the stack of 57 globally distributed benthic δ18O records ((Lisiecki & Raymo, 2005). Several numerical experiments were performed with the Match 2.2.2. software. A good agreement with available IRSL ages can be obtained forcing the program to match the begin/end points of the signal with the begin/end points of the target. We consider that times series obtained in this way are more reliable than those obtained using a numerous correlation points between signal and the target curve (e.g. Heslop et al, 2000). Spectral and wavelet analysis of these times series shows that 100 ka and 41 ka are the dominant frequencies. The new age-depth models show that paleosols with high values of magnetic susceptibility correspond to odd MIS numbers. The maximum age of the studied sections is around 650 ka.