



Use of magnetic parameters for dust source discrimination and spatial correlation of loess-palaeosol sections from North Bulgaria

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Spatial and temporal correlations of loess-palaeosol sections is of great importance for establishing consistent and reliable reconstruction of the major (global) as well as regional climate changes during the Quaternary. Rock magnetic studies give important proxy records of palaeoenvironmental changes. The aim of our study is to carry out a detailed magnetic investigation of different loess-palaeosol sections from North Bulgaria, situated in different geomorphological and palaeoclimatic areas, thus enabling comparison of their magnetic response to the main environmental factors. Two of the loess-palaeosol profiles (Harletz and Orsoja) are developed on river terraces of Ogosta river and Danube river, while the third section (Durankulak) is at the Black sea coast. The set of rock-magnetic measurements includes determination of magnetic susceptibility and its frequency dependence, hysteresis parameters and ratios (H_c , H_{cr} , M_{rs}/M_s , H_{cr}/H_c) and Curie points of the main ferromagnetic carriers as deduced from thermomagnetic K(T) analysis. The variation of magnetic susceptibility and the percent frequency dependence downward the profiles shows the onset of the main glacial – interglacial conditions, as well as subtle changes in the relative strength of aeolian dust accumulation and pedogenic alteration. A comparison between median susceptibility values of the youngest loess (L1) of the three sections shows very close similarity, however, the section Durankulak (at the Black sea) is characterized by $X_{fd}\%$ twice higher than the corresponding values for the other two sections. This observation, together with the calculated background susceptibilities suggests completely different source area for the Black sea loess deposits. The effective magnetic grain size of the remanence-carrying fraction, deduced by the values of size-dependent hysteresis parameters, suggests that the sediments from Harletz profile contain larger

magnetic grains in comparison with the other two profiles. This indicates closer dust source area, which is also supported by the high thickness of L1.