

Link between magnetic susceptibility and environmental changes in Late Pliocene-Quaternary lacustrine sediments of the Qaidam Basin (NE Tibetan Plateau)

Christian Herb¹, Andreas Koutsodendris², Weilin Zhang^{1,3}, Erwin Appel¹, Xiaomin Fang³, Jörg Pross²

¹ Department of Geosciences, University of Tübingen, Hölderlinstr. 12, 72074 Tübingen, Germany

² Institute of Geosciences, University of Frankfurt, Altenhöferallee 1, 60438 Frankfurt, Germany

³ Institute of Tibetan Plateau Research, Chinese Academy of Sciences, P.O. Box 2871, Beijing 100085, China
christian.herb@uni-tuebingen.de

A multi-proxy approach (including magnetic proxies, palynology, geochemistry and sedimentology) on the ~940-m-long drill core SG-1 from the western Qaidam Basin on the NE part of the Tibetan Plateau reveals the climate evolution during the late Pliocene-Quaternary (~2.8 Ma to 0.1 Ma). Especially magnetic susceptibility (χ) shows to bear a response to past climate detected (i) by analysing magnetic mineralogy and magnetic grain sizes, (ii) by searching for orbital cycles, and (iii) by comparing χ to palynological results. For the comparison of χ to pollen concentrations, we use the *Artemisia/Chenopodiaceae* (A/C) ratio as an indicator of moisture availability on 41 samples spanning the Mid-Pleistocene Transition (MPT; ~1 Ma) and another 40 samples along the entire core at particularly pronounced minima and maxima values of χ . Our results indicate that less dry phases (higher A/C ratio) correlate with low χ , whereas drier phases with high χ . The strong correlation of χ and the palynological results manifest the response of χ to climate change (notably moisture) and demonstrate the value of χ as a key parameter for high-resolution paleoclimate analysis in the Qaidam Basin.

Key words: Magnetic proxies; Pollen; Lacustrine sediments; Paleoclimate; Qaidam Basin; Tibetan Plateau