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## 天山北麓黄土环境磁学特征及其古气候意义

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Magnetic characteristics of loess-paleosol sequences on the north slope of the Tianshan Mountains, northwestern China and their paleoclimatic implications

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摘要

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摘要

新疆黄土-古土壤序列环境磁学参数的变化机理及其气候意义仍存在争议. 本文选择天山北麓的中梁黄土剖面, 系统开展了低温和常温下环境磁学参数的测试与研究, 测量包括室温的磁化率与饱和磁化强度, 以及磁化率与饱和和剩余磁化强度的低温变化. 结果发现, 该剖面黄土和古土壤样品的磁性矿物主要由磁铁矿与磁赤铁矿组成, 不含任何粒级成壤形成的超顺磁矿物颗粒, 其磁化率信号主要记录了粉尘磁性矿物含量变化, 较高的磁化率指示较强的风动力状况或者较近的风尘源区, 新疆黄土的这种环境磁学"风尘输入模式"可用来重建干旱区的风动力强弱变化.

关键词 新疆黄土, 环境磁学, 沉积通量, 风动力

Abstract:

Controversy remains in decoding paleoclimatic information via environmental magnetic methods based on loess deposition in drylands of northwestern China. A systematic mineral magnetic investigation was carried out in the loess-paleosol sequence at Zhongliang, located on the north slope of the Tianshan Mountains. The results show that ferrimagnetic minerals are mainly comprised of magnetite and maghemite. Besides, no evidence for the existence of pedogenic superparamagnetic particles is found in this work, which indicates that magnetic variation was caused mainly by changes of input concentration of magnetic assemblages, thus the higher susceptibility reflects stronger wind intensity and/or closer dust source(s). This kind of "dust input mode" can be used to reconstruct paleo wind intensity in dry lands.

Keywords Xinjiang Loess, Environmental magnetism, Deposition flux, Wind intensity

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