

## **The Use of Quaternary Magnetostratigraphy in Long Distance Correlation and Depositional Processes**

**N Rutter** Department of Earth and Atmospheric Sciences, University of Alberta, Edmonton, AB Canada T6J 2E3; ph. 780-492-3085; fax 780-492-2030; e-mail: nat.rutter@ualberta.ca); **M E Evans** (Institute for Geophysical Research, Physics Department, University of Alberta, Edmonton, AB Canada T6G 2J1; ph. 780-492-5517; fax 780-492-4256; e-mail: evans@phys.ualberta.ca

**In collaboration with numerous colleagues, we are investigating and correlating Quaternary paleoclimatic records of long sequences of loess (eolian) deposits from many parts of the world. These include sequences in Argentina, United States, European Russia, Siberia and China. The most reliable region-to-region correlation tool has been magnetostratigraphy, following the seminal work of Shackleton and Opdyke (1973). Quaternary loess deposits clearly record the Brunhes, Matuyama and Gauss Chrons and the Jaramillo and Olduvai Subchrons. The presence or absence of these magnetic zones in each sequence has aided in the interpretation of the depositional and erosional patterns over wide areas. This is especially true in the Chinese Loess Plateau, where near-continuous records have been correlated to deep sea records expanding our understanding of terrestrial and oceanic processes. Magnetic susceptibility has been used in conjunction with magnetostratigraphy to establish the timing of hemispheric-wide climatic variations which has helped us to discern Milankovitch cyclicities corresponding to marine oxygen isotope stages. Efforts to exploit shorter timescale geomagnetic variability (excursions, secular variation) have generally been disappointing. It seems that remanence acquisition in loess is a lengthy process (on the order of 104 years). This tends to smooth out rapid fluctuations, but recent modeling results suggest that it can also generate artificial reversals.**

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