

Cryptochrons and Brief Subchrons Recorded at ODP Site 1218 (Equatorial Pacific)

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ODP Site 1218 yielded an exceptional record of the direction of the geomagnetic field during most of the Miocene and Oligocene. The sedimentation rate in the Oligocene and the lower Miocene carbonate-rich pelagic sediments is relatively high (> 10 m/Myr) and measurements on u-channel samples allowed a high-resolution magnetostratigraphy that, we believe, has the potential to resolve polarity chrons with duration as short as 10 kyr. An attempt to further improve the resolution was made by deconvolution of the original signal. This high-resolution magnetostratigraphy, recorded in a long sedimentary record with very uniform magnetic properties, has been used to test if the small-scale magnetic anomalies on the ocean floor (cryptochrons) represent short polarity subchrons or intensity fluctuations of the geomagnetic field. The results did not give a simple answer to this question. In the ODP Site 1218 record, we observe several short polarity subchrons, with duration of about 10 kyr. A few of them occur where cryptochrons are expected according to the Cande and Kent (CK95) geomagnetic polarity time scale, but other brief subchrons apparently occur where no cryptochron is expected. The majority of the cryptochrons in CK95, such as those in polarity chron C12r, are not represented by corresponding reversals in the sedimentary record, suggesting that most of the cryptochrons represent fluctuations of field intensity.