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Miocene-Oligocene magnetostratigraphy from Equatorial Pacific sediments (ODP Site 1218, Leg 199)

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ODP Site 1218 was cored in the equatorial Pacific Ocean during Leg199. The 270 m of sediments from the site yielded an excellent record of the geomagnetic polarity reversals for the entire Miocene and most of the Oligocene. Nannofossils and radiolarians indicate that the section is biostratigraphically complete with no apparent hiatuses. The top 165 m of Site 1218 was cored using the Advanced Piston Corer and sediment cores could be azimuthally oriented preserving the declination information. The high-resolution magnetostratigraphic record has been obtained by measurements made on u-channel samples, augmented by about 300 discrete samples. U-channel samples were measured at 1cm interval and stepwise demagnetized in alternating field up to a maximum peak field of 80 mT. The Characteristic Remanent Magnetization directions were determined each 1 cm by principal component analysis for demagnetization steps in the 20 mT to 50mT peak field range. A similar treatment was carried out on the discrete samples, that gave results compatible with u-channel measurements. . Magnetostratigraphy from u-channel samples are compared with shipboard data that was based on blanket demagnetization at peak AF fields of 20 mT. U-channel measurements add more detail to the magnetostratigraphic record and allow identification of short polarity zones especially in the upper part of the section were the sedimentation rates are very low (~2m/Ma) The component magnetization directions determined from u-channel measurements also gave more reliable and precise estimates of inclination (paleolatitude). Although the calculation of the paleomagnetic pole is hindered by the low precision of the cores' azimuth orientation, the excellent data from both u-channel and discrete samples allow determining of the paleolatitude of the Site for different ages with relatively high precision. Paleomagnetic data indicate that the paleolatitude of Site 1218 is increasing with time form nearly equatorial in the Oligocene to its present latitude. Within the precision given by the paleomagnetic method, this is in agreement with current predictions of plate motion.

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