

A high-resolution magnetic record of the Brunhes-Matuyama polarity transition in a core from Osaka Bay, southwestern Japan

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A detailed study of the Brunhes-Matuyama geomagnetic reversal transition in a sediment core from Osaka Bay revealed four conspicuous short reversal episodes. These episodes extended about 6.4 m in a marine clay layer deposited during a high sea level period corresponding to the marine oxygen isotope stage 19. The lower two episodes underlie the main Brunhes-Matuyama polarity boundary (BMB), and the upper two overlie it (The BMB lies at a depth of 400.22 m). All of these episodes include full reversal fields. Various rock magnetic measurements confirm the magnetic uniformity and suitability of sediments for paleomagnetic study. A symmetrical paleointensity drop during the transition process was clearly noticed over 8.3 m. A minimum intensity of 12-15 % of the post-reversal mean occurred 2.5 m below the BMB, between the lowermost two episodes. Intensity recovers to 50-60 % at the BMB, and to about 100 % 1.1 m above the BMB. An age model was constructed by matching a sea level change curve estimated from diatom analyses to the marine oxygen isotope curve of Bassinot et al. (1994). The BMB, which lies between stages 19.3 and 19.2, is astrochronologically dated to be 775 ka. Mid-ages of the episodes are estimated to be -9000, -2200, 900 and 3000 yr after the BMB, in the ascending order. Time spans are estimated as 1500 yr for the lowermost episode, and 500 yr or less for the others.