

PDRM lock-in に起因する Brunhes-Matuyama 境界年代値の系統的なずれ

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A systematic offset of the Matuyama-Brunhes boundary age in marine sediments due to the PDRM lock-in

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The Matuyama-Brunhes (M-B) boundary age has been estimated from astronomical ages of marine sediments and $^{40}\text{Ar}/^{39}\text{Ar}$ ages of volcanic rocks. Although the currently popular age for the M-B boundary is 780 ka, recent studies have questioned conventional estimates of the boundary age. Here, I present clear evidence for the existence of errors in paleomagnetic dating due to the effect of post-depositional remanent magnetization (PDRM) lock-in depth, based on a comparison between previously published marine isotope ages for the Matuyama-Brunhes (M-B) boundary and sedimentation rates. The present findings indicate that the age of the M-B boundary should be revised to ca. 770-773 ka and that the boundary most likely lies in the late Marine Isotope Stage (MIS) 19 rather than the middle of MIS 19. The delay of benthic foraminiferal $\delta^{18}\text{O}$ data due to the ocean circulation is tentatively accounted for the calculation. This new age for the M-B boundary is consistent with that obtained from the EPICA Dome C core using an EDC3 age model. In contrast, an age offset for the M-B boundary is recognized between marine sediments and recent $^{40}\text{Ar}/^{39}\text{Ar}$ ages. To resolve this discrepancy, additional data are required from marine sediments, volcanic rocks, and ice cores.