

A detailed paleomagnetic record during the Matuyama-Brunhes polarity transition from the Chiba composite section, a candidate for the L-M Pleistocene boundary GSSP

*Makoto Okada¹, Yusuke Suganuma², Yuki Haneda³

1. Department of Earth Sciences, Faculty of Science, Ibaraki University, 2. National Institute of Polar Research, 3. Graduate School of Science and Engineering, Ibaraki University

We report a high-resolution paleomagnetic record from a continuous marine succession in the Chiba composite section of the Kokumoto Formation, Kazusa Group, Japan. The Chiba composite section is a candidate for the Lower-Middle Pleistocene boundary GSSP. Our record reveals detailed behaviors of the virtual geomagnetic poles (VGPs) and relative paleointensity changes during the Matuyama-Brunhes (M-B) polarity transition. The resultant relative paleointensity and VGP records show a significant paleointensity minimum near the M-B boundary, which is accompanied by a clear “polarity switch.” A high-resolution oxygen isotope chronology for the Chiba composite section indicates that the M-B boundary is located in the middle of Marine Isotope Stage (MIS) 19 and yields an age of 771.7 ka for the boundary. This age is consistent with those based on the latest astronomically tuned marine and ice core records and with the recalculated age of 770.9 ± 7.3 ka deduced from the U-Pb zircon age of the Byk-E tephra. To the best of our knowledge, our paleomagnetic data especially for the relative paleointensity represent one of the most detailed records on this geomagnetic field reversal that has thus far been obtained from marine sediments and will therefore be key for understanding the dynamics of the geomagnetic dynamo and for calibrating the geological time scale.

Keywords: L-M Pleistocene boundary GSSP, paleomagnetism, geomagnetic reversal