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An upper Olduvai polarity transition record from the Ofuna Formation, Kazusa Group, in Yokohama, central Japan

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We report a detailed geomagnetic record including direction and proxies of paleointensity at around the upper Olduvai polarity transition from an on-land core, named as Core-I, drilled by Yokohama National University at Segami, southern part of the Yokohama City. The 105 meters length core covers a part of the Ofuna Formation, Pleistocene marine sequence, consisting of massive siltstone intercalating ash and thin sand layers. Two ash layers detected at depths of 9 and 27 meters below the surface have been correlated with Kd38 and Kd39 respectively, which are key tephras recognized in Japan as indicating ages just above the upper Olduvai boundary.

1-inch diameter mini-cores were taken for paleomagnetic and rock-magnetic measurements using a core-piker at 452 stratigraphic levels from Core-I between 75 and 105 meters with intervals of 2 to 10 cm thickness. Measurements for stepwise alternating field demagnetization (AFD) from 5 mT up to 60 mT with 5 mT steps, anisotropy of magnetic susceptibility (AMS), and anhysteretic remanent magnetization (ARM) were conducted for specimens at all the 452 levels, and stepwise thermal demagnetization were done for selected 30 specimens. As the results, at most of the specimens, secondary components were removed up to 25 mT and/or 250 degree C levels and characteristic remanent magnetization (ChRM) components were extracted. The upper Olduvai polarity transition was detected between 82 and 87 meters corresponding with a 7 kyrs time span between 1784Ka and 1777Ka, which were derived by an age model using oxygen isotopic analyses.

Keywords: paleomagnetism, geomagnetic polarity transition, Olduvai subchron, geomagnetic paleointensity