EGU26-11479, updated on 07 Nov 2026
https://doi.org/10.5194/egusphere-egu26-11479
EGU General Assembly 2026
© Author(s) 2026. This work is distributed under
the Creative Commons Attribution 4.0 License.

Paleomagnetic records of Matuyama chron and beyond from North Atlantic drift sediments: IODP Expedition 384/395C/395 sites

Anita Di Chiara[1], Sara Satolli[2], Sarah Friedman[3], Deepa Dwyer[4], Gary Acton[5], Boris Theofanis Karatsolis[6], Tom Dunkley Jones[7], Paul N. Pearson[8], Takuma Suzuki[9], Anne Briais[10], Ross Parnell-Turner[11], Leah LeVay[5], and Expedition 395 Science Party[12]

[1]Istituto Nazionale di Geofisica e Vulcanologia, Via di Vigna Murata 605, Roma, Italy
[2]Department of Engineering and Geology, University of Chieti-Pescara, Via dei Vestini 31, Chieti, Italy
[3]School of Earth, Environment & Sustainability, Georgia Southern University, Statesboro, GA, USA
[4]College of Earth Ocean and Atmospheric Sciences, Oregon State University, 1500 SW, Jefferson Way, Corvallis, OR, USA
[5]International Ocean Discovery Program, Texas A&M University, 1000 Discovery Drive, College Station, TX, USA
[6]Department of Geosciences, University of Fribourg, Fribourg, Switzerland
[7]School of Geography, Earth and Environmental Sciences, University of Birmingham, Birmingham, United Kingdom
[8]Department of Earth Sciences, University College London, Gower Street, London, United Kingdom
[9]SUGAR, X-star, Japan Agency for Marine-Earth Science and Technology (JAMSTEC), Yokosuka, Japan
[10]Geo-Ocean, Centre National de la Recherche Scientifique (CNRS), Institut Universitaire Européen de la Mer, Rue Dumont d'Urville, Plouzané, France
[11]Institute of Geophysics & Planetary Physics, Scripps Institution of Oceanography, University of California, San Diego, La Jolla, CA, USA
[12]https://iodp.tamu.edu/scienceops/precruise/reykjanes/participants_395C.html

Drift sediments in the North Atlantic accumulated rapidly (≥10 cm/kyr) over the past ~3.6 Ma, enabling high-resolution reconstructions of geomagnetic field behavior. Previous scientific drilling expeditions (e.g., ODP Leg 162, IODP Exp. 306) from the North Atlantic refined the Quaternary Geomagnetic Instability Time Scale (GITS; 0–2.58 Ma) by revealing short-lived geomagnetic instabilities like the Iceland Basin Excursion (~188 ka). Here, we aim at further refining the GITS by studying newly collected cores in the same area.

Between 2020 and 2023, the International Ocean Discovery Program (IODP) Expeditions 384, 395C, and 395 targeted six sites: five along a transect east of the Mid-Atlantic Ridge (20–30°W, ~60°N) and one west of Greenland. These expeditions targeted the volcanic basement that forms the V-shaped ridges/troughs on the Reykjanes Ridge and the overlying sediments that record deepwater current evolution. Shipboard age models are based on paleomagnetic and microfossil data, but a robust and reliable paleomagnetic record extends up to 11 Ma.

We present results from Expeditions 384/395C/395 sediments that capture most GITS magnetic events (excursions and reversals) within the Matuyama chron. These records hold potential to extend the GITS backward in time, bolstering magnetic instabilities as geochronologic tools and refining models of Earth's ancient geomagnetic variations.