

New method for the chronostratigraphic reconstruction of Pliocene marine sediments at the subpolar North Atlantic

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We established a new method to reconstruct chronostratigraphy of subpolar North Atlantic sediments during the Pliocene by using a new hybrid environmental proxy. Pliocene sediments recovered at IODP Site U1314 in the Gardar Drift (North Atlantic) are characterized by the paucity of foraminiferal tests, and this hampered the establishment of an age-depth model of the sediments by the orbital tuning method using an oxygen isotope record. Therefore, we created the hybrid environmental proxy by combining magnetic susceptibility and natural gamma radiation as a tuning material. In the hybrid proxy record, glacial-interglacial climate variations are extracted and the small-scale variations (attributed to ice-rafted debris) are eliminated. We established a high-resolution age model for the sediments at IODP Site U1314 during 2.76-2.10 Ma by tuning the hybrid proxy record to the global standard oxygen isotope record (LR04 stack). We would point out the possibility that our tuning method may be applicable to other Pliocene sediments in subpolar North Atlantic regions.

Keywords: chronostratigraphy, Pliocene, marine sediments, North Atlantic, magnetic susceptibility, natural gamma radiation