Geochemistry, Geophysics, Geosystems

Supporting Information for

Magnetic record of deglaciation using FORC-PCA, sortable-silt grain size, and magnetic excursion at 26 ka, from the Rockall Trough (NE Atlantic)

J.E.T. Channell[1], R.J. Harrison[2], I. Lascu[2], I. N. McCave[2], F.D. Hibbert[3], W.E.N. Austin[4,5]

[1]Department of Geological Sciences, POB 112120, University of Florida, Gainesville, FL 32611 (USA)

[2]Department of Earth Sciences, University of Cambridge, Cambridge, CB2 3EQ (UK)

[3]Research School of Earth Sciences, Australian National University, Canberra, ACT 2601, Australia

[4]School of Geography and Geosciences, University of St. Andrews, St. Andrews, KY16 9AL (UK)

[5]Scottish Marine Institute, Scottish Association for Marine Science, Oban PA37 1QA, (UK)

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Introduction

Additional information related to the age model for Core MD04-2822, supplemental to Figure 2.

Figure S1. Age-depth relationship for Core MD04-2822 with age error estimates.

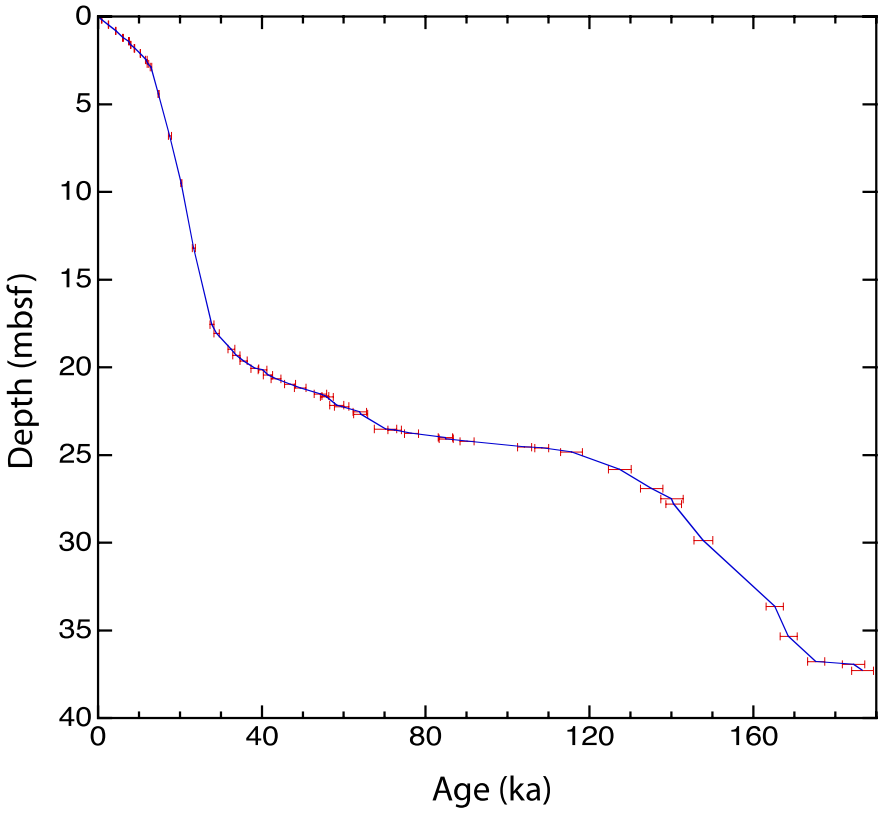

Table S1: Radiocarbon dates used in the construction of the MD04-2822 age model

* calibrated using OxCal (version 4.2; Bronk-Ramsey, 2009) using the Marine13 calibration curve (Reimer et al., 2013)
† calibrated using OxCal (version 4.2; Bronk-Ramsey, 2009) using the Marine13 calibration curve (Reimer et al., 2013) and deposition model in (Bronk Ramsey and Lee, 2013); k parameter of 1 but allowed to vary between a factor of 10^{-2} and 10^{2} to allow for changes in deposition.
(a) The similarity of the radiocarbon determinations results from the biological mixing of sediments (cf. Brown et al., 2001), as such we set the bottom of the surface mixed layer to a depth of 15.5 cm and use an average of these three radiocarbon dates in the age model for MD04-2822 (Table 2, "mixed layer")
(b) average (n=6) for the wider region gives a value of $\Delta R = -1 \pm 53$ (Harkness, 1983; Hãykansson, 1984; Olsson, 1980)
(c) for sample SUERC 12920 we use $\Delta R = 700 \pm 500$ for calibration. Austin et al., 1995 suggest $\Delta R = 700$ for the area during the Younger Dryas; we assume similar surface conditions but recognize that ΔR have have been far greater (cf. Waelbroeck et al., 2001) by including a ± 500 year uncertainty

Depth cm	Publication Code	Material dated	Species	Conventional ^{14}C (years)	±1 sigma	$\Delta R \pm 1$ sigma (years)	Calibrated 14C age BP (unmodelled*) (95% range) (years BP)	μ (years)	± σ	Calibrated 14C age BP (modelled†) (95%)(years BP)	μ (years)	± σ
0.5	SUERC 20177[(a)]	Planktonic foraminifera	*G. bulloides*	1352	35	0 ± 50[(b)]	886 to 733	807	41	n/a	n/a	n/a
5.5	UBA 29428[(a)]	Planktonic foraminifera	*G. bulloides*	1333	33	0 ± 50[(b)]	949 to 784	871	43	n/a	n/a	n/a
15.5	UBA 29429[(a)]	Planktonic foraminifera	*G. bulloides*	1260	21	0 ± 50[(b)]	972 to 790	892	46	n/a	n/a	n/a
45.5	UBA 29430	Planktonic foraminifera	*G. bulloides*	2792	23	0 ± 50[(b)]	2690 to 2358	2534	91	2680 to 2351	2518	95
80.5	UBA 29431	Planktonic foraminifera	*G. bulloides*	4311	28	0 ± 50[(b)]	4605 to 4255	4438	85	4561 to 4270	4422	73
120.5	UBA 29432	Planktonic foraminifera	*G. bulloides*	5648	26	0 ± 50[(b)]	6185 to 5911	6052	73	6171 to 5907	6038	82
140.5	UBA 29433	Planktonic foraminifera	*G. bulloides*	6995	29	0 ± 50[(b)]	7593 to 7397	7491	50	7576 to 7396	7483	50
160.5	UBA 29434	Planktonic foraminifera	*G. bulloides*	7539	35	0 ± 50[(b)]	8146 to 7875	8004	68	8121 to 7865	7984	64
180.5	UBA 29435	Planktonic foraminifera	*G. bulloides*	8313	33	0 ± 50[(b)]	9015 to 8645	8857	97	9008 to 8653	8856	101
210.5	SUERC 17731	Planktonic foraminifera	*G. bulloides*	9552	39	0 ± 50[(b)]	10569 to 10237	10410	89	10559 to 10234	10392	132
950.5	SUERC 12920	Planktonic foraminifera	*N. pachyderma* (sinistral)	17200	70	700 ± 500[(c)]	20611 to 18287	19445	581	20559 to 18604	19553	497

Table S2: Input tie-points used to construct the age model for Core MD04-2822.

Age model constructed using 'Poisson' function (deposition model) in OxCal (Bronk Ramsey and Lee, 2013); k parameter of 1 but which can vary between a factor of 10^{-2} and 10^{2} to allow for changes in deposition. Age uncertainty estimates for each tie-points, except for radiocarbon dates, are the mean squared estimate of: the reference chronology uncertainty (i.e. NGRIP $\delta^{18}O$ on the GICC05 timescale, Rasmussen et al., 2014 and references therein; EDC methane record on the AICC2012 chronology, Bazin et al., 2013 and; LR04 $\delta^{18}O$ stack, Lisiecki and Raymo, 2005) and tuning uncertainties. For tuning to the Greenland ice cores, we use the updated ice core nomenclature (where GI = Greenland Interstadial and GS = Greenland Stadial) and ages (Rasmussen et al., 2014 and references therein). Radiocarbon dates were calibrated using the Marine13 calibration curve (Reimer et al., 2013); $\Delta R = 0 \pm 50$ for all samples except SUERC 12920 where this was increased to $\Delta R = 700 \pm 500$ to account for changes in the glacial surface ocean. The mixed depth was set at 15.5 cm and an average of three radiocarbon dates used (SUERC 20177, UBA 29428, UBA 29429, Table 1). Note radiocarbon dates are reported here as conventional ^{14}C.

* Conventional ^{14}C age (and ± 1 sigma uncertainty)

Depth (cm 1 dp)	Age (ka)	± 1 σ (ka, 2dp)	Tie-point origin
0	0.000	0.20	Core top
15.5	1.350	0.02	Depth of bottom of mixed layer: average of 3 ^{14}C date (all *G. bulloides*, Table 1)
45.5	2.792*	0.02	^{14}C date: UBA29430 (*G. bulloides*)
80.5	4.311*	0.03	^{14}C date: UBA29431 (*G. bulloides*)
120.5	5.648*	0.03	^{14}C date: UBA29432 (*G. bulloides*)
140.5	6.995*	0.03	^{14}C date: UBA29433 (*G. bulloides*)
160.5	7.539*	0.04	^{14}C date: UBA29434 (*G. bulloides*)
180.5	8.313*	0.03	^{14}C date: UBA29435 (*G. bulloides*)
210.5	9.552*	0.04	^{14}C date: SUERC17731 (*G. bulloides*)
246.5	11.703	0.09	Start of Holocene – correlation to NGRIP $\delta^{18}O$
270.5	12.171	0.04	Tephra horizon: Vedde Ash (I-RYH-I)
287.5	12.896	0.10	GS1 – correlation to NGRIP $\delta^{18}O$
440.5	14.692	0.13	GI-1e – correlation to NGRIP $\delta^{18}O$
680.5	17.480	0.33	GI-2.1 – correlation to NGRIP $\delta^{18}O$
950.5	17.200*	0.07	^{14}C date: SUERC129020N (*N. pachyderma* (sin.))
1319.6	23.340	0.41	GI2.2 – correlation to NGRIP $\delta^{18}O$
1756.0	27.780	0.57	GI-3 – correlation to NGRIP $\delta^{18}O$
1805.4	28.900	0.61	GI-4 – correlation to NGRIP $\delta^{18}O$
1895.7	32.500	0.77	GI-5.2 – correlation to NGRIP $\delta^{18}O$
1930.5	33.740	0.83	GI-6 – correlation to NGRIP $\delta^{18}O$
1962.1	35.480	0.91	GI-7c – correlation to NGRIP $\delta^{18}O$
2006.6	38.220	0.99	GI-8c – correlation to NGRIP $\delta^{18}O$
2014.5	40.160	1.09	GI-9 – correlation to NGRIP $\delta^{18}O$
2044.1	41.460	1.12	GI-10 – correlation to NGRIP $\delta^{18}O$
2065.6	43.340	1.20	GI-11 – correlation to NGRIP $\delta^{18}O$

2095.2	46.860	1.33	GI-12c – correlation to NGRIP $\delta^{18}O$
2116.7	49.280	1.41	GI-13c – correlation to NGRIP $\delta^{18}O$
2151.6	54.220	1.57	GI-14e – correlation to NGRIP $\delta^{18}O$
2163.5	55.380	0.81	Tephra horizon: NAAZII
2168.0	55.800	1.62	GI-15.2 – correlation to NGRIP $\delta^{18}O$
2215.3	58.280	1.72	GI-16.2 – correlation to NGRIP $\delta^{18}O$
2223.6	59.440	1.75	GI-17.2 – correlation to NGRIP $\delta^{18}O$
2254.5	63.840	1.70	GI-18 – correlation to NGRIP $\delta^{18}O$
2352.0	70.150	2.72	Correlation to LR04 $\delta^{18}O$
2357.3	72.340	1.70	GI-19.2 – correlation to NGRIP $\delta^{18}O$
2376.8	76.440	1.70	GI-20c – correlation to NGRIP $\delta^{18}O$
2399.7	84.760	1.71	GI-21.1e – correlation to NGRIP $\delta^{18}O$
2407.5	84.600	1.70	GS-22 – correlation to NGRIP $\delta^{18}O$
2412.4	90.040	1.70	GI-22g – correlation to NGRIP $\delta^{18}O$
2455.4	104.040	1.72	GI-23.1 – correlation to NGRIP $\delta^{18}O$
2460.1	108.280	1.71	GI-24.2 – correlation to NGRIP $\delta^{18}O$
2483.3	115.540	2.72	Correlation to LR04 $\delta^{18}O$
2581.3	127.321	2.72	Correlation to LR04 $\delta^{18}O$
2691.7	135.072	2.73	Correlation to LR04 $\delta^{18}O$
2750.8	140.004	2.72	Correlation to LR04 $\delta^{18}O$
2779.2	140.515	1.90	Correlation to Antarctic (EDC) methane
2986.7	147.720	2.25	Correlation to Antarctic (EDC) methane
3363.5	165.159	2.14	Correlation to Antarctic (EDC) methane
3534.3	168.542	2.04	Correlation to Antarctic (EDC) methane
3677.7	175.269	2.03	Correlation to Antarctic (EDC) methane
3693.2	184.404	2.73	Correlation to LR04 $\delta^{18}O$
3730.2	186.600	2.72	Correlation to LR04 $\delta^{18}O$