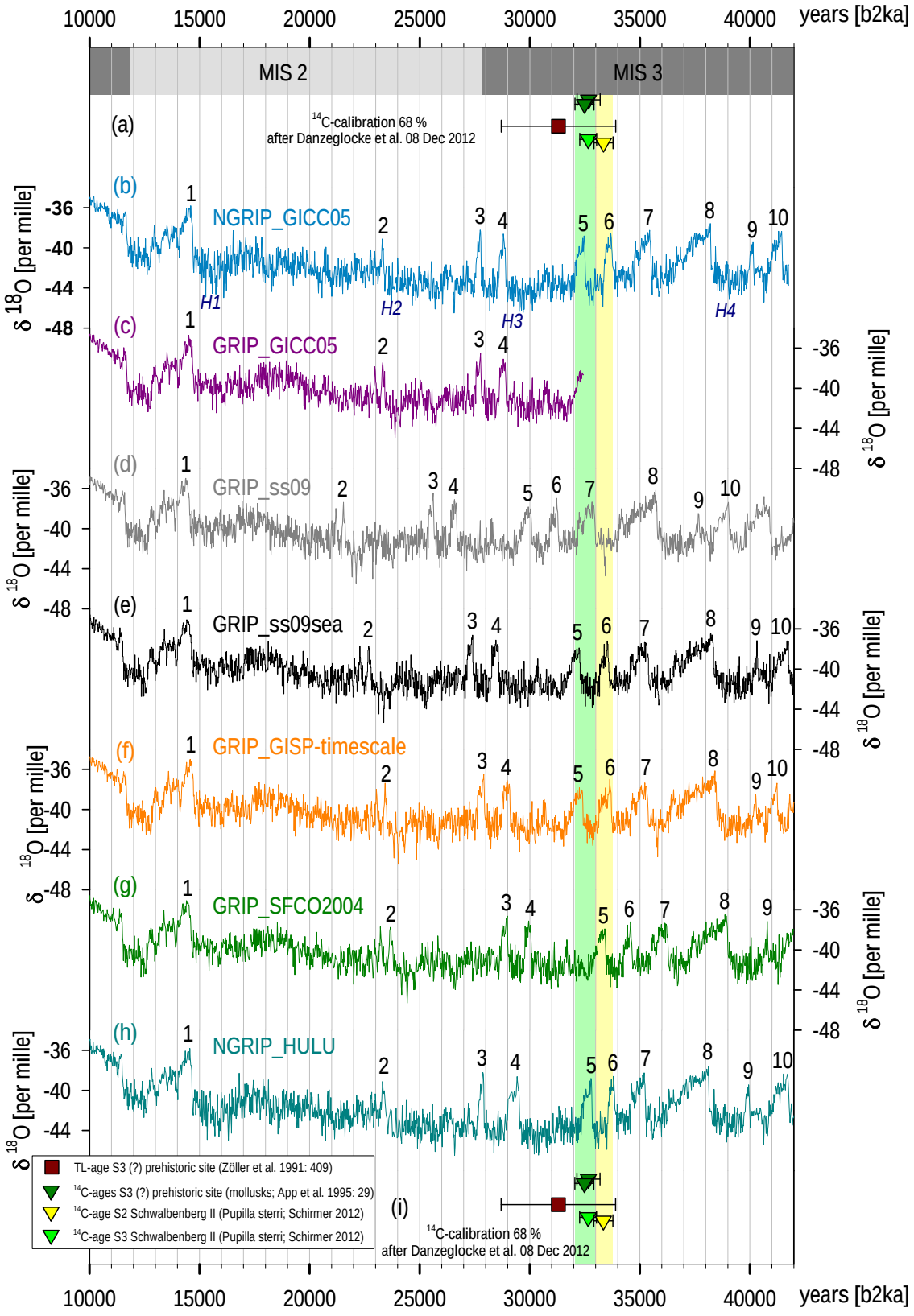

Figure S1 – supplementary material: The palaeo-Cambisols Sinzig 2 (S2) and Sinzig 3 (S3) at the loess section Schwalbenberg II as reflected in the Greenland (GRIP) and Northern Greenland (NGRIP) ice-core records. Greenland interstadials (GIS) indicated by numbers 1 – 10. Heinrich events # 1 – 4 in subfigure (b) tentatively indicated by *H1 – H4*.

(a) TL- and ^{14}C-ages from Schirmer (2012; and literature quoted therein). Luminescence and radiocarbon ages are illustrated on the 1 sigma error level. The TL-age of Zöller et al. (1991) and the ^{14}C-ages of App et al. (1995) are from a cambisol from a loess section few decameters from the Schwalbenberg II site. According to Schirmer (2012) the cambisol, which apparently terminates the Middle Pleniglacial loess-palaeosol sequence, might correspond to Sinzig Soil 3 (S3) at the Schwalbenberg II section, in the figure legend denoted with a question mark ("S3 (?)"). ^{14}C-calibration (1 sigma) occurred with CalPal_online (Danzeglocke et al., 8th December 2012). Sample numbers of App et al. (1995) are Pta-2721 and Pta-2722 which yielded calibrated ages of 32150 – 33190 cal BP and 32060 – 32920 cal BP, respectively. Samples KIA22209 and KIA22208 gave ages of 32270 – 33040 cal BP (for S3) and 32910 – 33780 cal BP (for S2). Please note that all ^{14}C-ages are from shell carbonate from molluscs which might overestimate the true age (cf. Lang et al., 2003). However, if these ages are accepted they could point to palaeosol formation during GIS6 for Sinzig Soil 2 (S2) and GIS5 for Sinzig Soil 3 (S3), respectively. The luminescence age for S3 of 31.3 ± 2.6 ka is slightly younger but covers the ^{14}C-ages for S3 on the 1 sigma error-level, a phenomenon observed also in other investigations (cf. e.g. Lomax et al, in press).

(b) – (f) data from the Centre for Ice and Climate/Niels Bohr Institute/University of Copenhagen: http://www.iceandclimate.nbi.ku.dk/; the δ^{18}O-data are as based on Dansgaard et al. (1993), GRIP Members (1993) and Johnsen et al. (1997) (for more details see below).

(b) NGRIP with Greenland Ice Core Chronology 2005 (GICC05) (Andersen et al., 2006; Svensson et al., 2006) released 10 September 2007; file name 'GICC05_NGRIP_20y_10sep2007'; the NGRIP-data for the time-window of 10 to 42 ka, as presented here, are all from core NGRIP2 only.

(c) GRIP with Greenland Ice Core Chronology 2005 (GICC05) (Andersen et al., 2006; Svensson et al., 2006) released 27 November 2006; file name 'GICC05_NGRIP_GRIP_20y_27nov2006'; prior to 11.7 ka the NGRIP-GICC05-timescale has been transferred to GRIP by the use of volcanic marker horizons and the linear interpolation in between Rasmussen et al. (2006; 2008).

(d) ss09-timescale (Johnsen et al., 1995) released 23 November 2000 by I.A. Mogensen; file name 'gripdelta.dat' (GRIP, oxygen isotopes, 20 years averages on GISP2 time scale, 375 - 103 000 yrs BP), colums 1-2.

(e) ss09sea or GRIP2001-chronology (Johnsen et al., 2001); ASCII-file (GRIP, oxygen isotopes, 20 year averages back to 122 kyrs BP.

(f) GISP-timescale as based on Alley et al. (1993), Meese et al. (1994) and Sowers et al. (1993) released 23 November 2000 by I.A. Mogensen; file name 'gripdelta.dat' (GRIP, oxygen isotopes, 20 years averages on GISP2 time scale, 375 - 103 000 yrs BP), colums 2-3.

(g) data of SFCO2004-timescale from the Pole-Ocean-Pole Project, Department of Earth Sciences, University of Cambridge: http://www.esc.cam.ac.uk/research/research-groups/pop/pop-project-data/pop-project-grip-data-on-sfcp2004-timescale; file name 'GRIP data on SFCP2004 timescale'; the SFCP2004-timescale (Shackleton et al., 2004) is based on the matching between the GRIP δ^{18}O-record and the δ^{18}O-record of planktonic foraminifera of piston core MD95-2042 (Shackleton et al., 2000) that is ^{14}C-dated by the use of a correction-curve based on paired ^{230}Th/^{234}U/^{238}U and ^{14}C dates on pristine coral samples Fairbanks et al. (2005).

(h) Greenland-Hulu U/Th timescale: Greenland NGRIP stable oxygen isotope record from Andersen et al. (2006; 2008) and Svensson et al. (2006) tuned to the Hulu Cave U/Th chronology and δ^{18}O-stratigraphy from Wang et al. (2001). Data-record from Weninger and Jöris (2008).

(i) like (a)

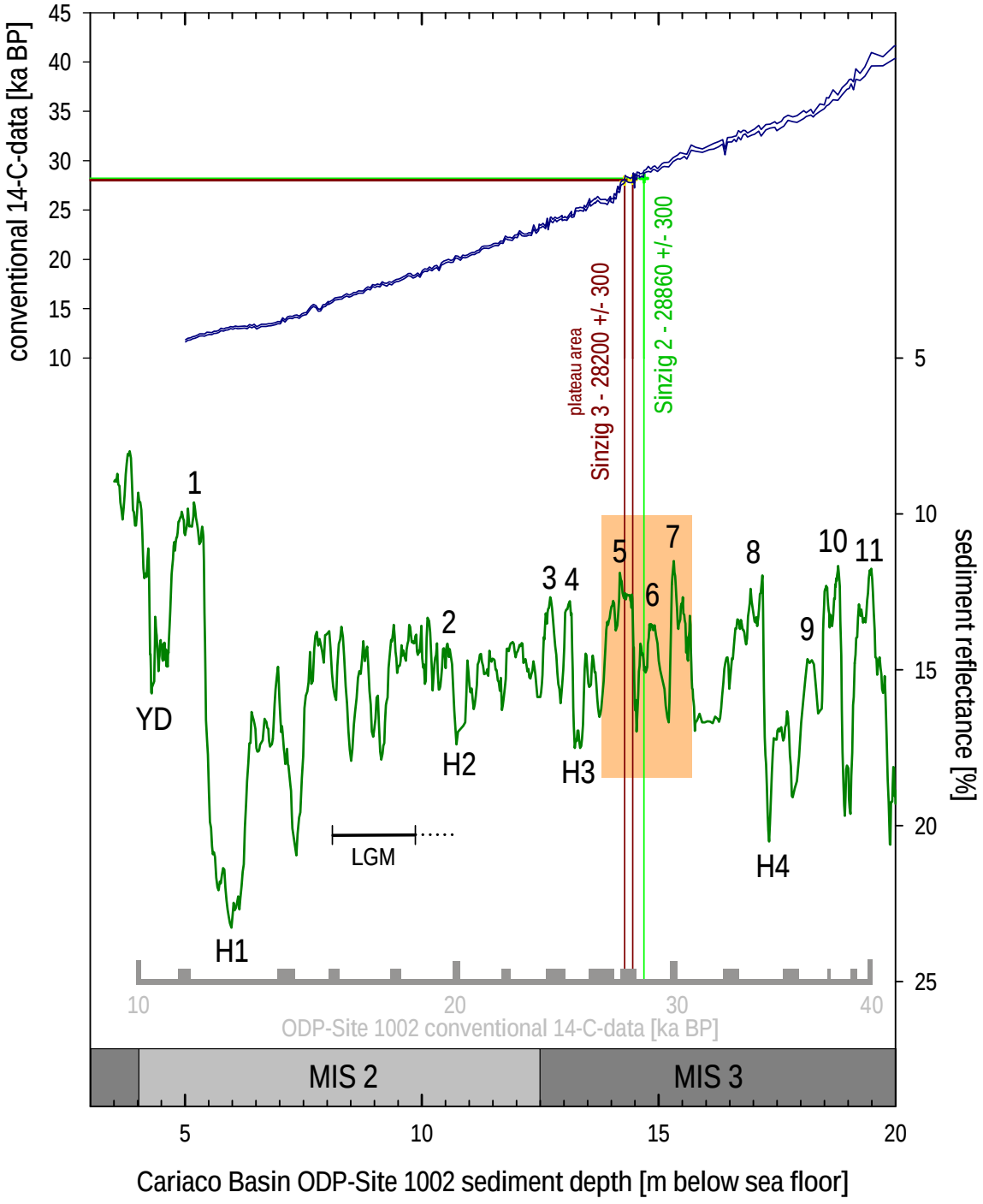

Figure S2 – supplementary material: Projection of the uncalibrated ^{14}C-values from the Schwalbenberg II loess-palaeosol section in the Middle Rhine Valley in Germany onto the palaeoclimate record of the Cariaco Basin. The graph is based on figure 1 of Tzedakis et al. (2007). The data of the palaeoclimate record of ODP-site 1002 were taken from the supplementary information of Tzedakis et al. (2007, tables S1a and S1b). ^{14}C-data from the Schwalbenberg II section are from Schirmer (2012). They are AMS data from the gastropod species Pupilla sterri. Sinzig 3 Soil (S3): KIA22209, 28,200 +300/-290 ^{14}C BP. Sinzig 2 Soil (S2): KIA22208: 28,860 +300/-290 ^{14}C BP, KIA22208). The area between the two brown lines covers the plateau area matching the S2-data. Like the calibrated ^{14}C-ages (cf. figure i – supplementary data), the uncalibrated data suggest a correlation with GIS6 (S2) and GIS5 (S3), respectively. The orange colored area indicates the time-window in which the Lohne Soil might have developed at the master loess section at Nussloch in southwestern Germany (cf. Kadereit et al., 2013).

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