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Centennial to millennial-scale dynamics of the N Atlantic circulation and the NW European Ice Sheet during MIS 3: Preliminary results of core MD04-2829 CQ (Rosemary Bank, N Rockall Trough)

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We investigate surface and deep ocean variability in the NE Atlantic Ocean and NW European Ice Sheet (NWEIS) stability synchronous with the short term climatic oscillations occurring during MIS 3. Core MD04-2829 CQ, Rosemary Bank, NE Atlantic Ocean (58° 56.93'S, 9° 34.30'W) was recovered at a water depth of 1743 m during the Marion Dufresne cruise MD141 within the programme SEQUOIA (Sequencing Ice-Ocean-Climate Interaction in the NE Atlantic during the Last Glacial). At present, this site is influenced by Wyville-Thomson Overflow Water (a precursor water mass of North Atlantic Deep Water, NADW) flowing SW over the Wyville-Thomson Ridge, and recirculating NADW, while the surface waters are dominated by the flow of the North Atlantic Drift towards the Norwegian Seas. We present initial results of a multiproxy palaeoceanographic study on the lower 7 m of this core. A preliminary age model, based on the correlation of the relative abundance of the planktonic foraminifer Neogloboquadrina pachyderma (left-coiling) with the GISP 2 isotopic record indicates that the material retrieved contains roughly the interval between MIS 2 and DO19 (MIS 4), with a mean sedimentation rate of approximately 15 cm kyr-1; higher rates of up to 20 cm kyr-1 are recorded during MIS 2 and in the colder episodes, characterized by higher terrigenous/ice rafted input. Planktonic foraminiferal assemblages show rapid changes closely mimicking the MIS 3 climatic oscillations. Cold intervals are characterized by peak abundance of the polar taxon

N. pachyderma (left-coiling), while transient increases of temperate/subtropical taxa highlight the milder interestadials, dominated by the cold/temperate species Turborotalita quinqueloba and Globigerina bulloides. These oscillations are directly correlated with the down-core variability of IRD abundance. High-resolution stable isotope measurements of planktonic (N. pachyderma (left-coiling) and G. bulloides) and benthic (Fontbotia wuellerstorfii and Globobulimina affinis) foraminifera are currently being performed in order to depict the geochemical characteristics of the water column during these events. Palaeotemperature estimates for the surface and subsurface waters (TFT, multi-species, Mg/Ca) will be used to infer changes in thermocline structure. Combined with geochemical analysis of the IRD coarse and fine fractions will allow us to achieve a highly detailed palaeoclimatic sequence of ice-ocean interactions during the last glacial period.