

Interactive comment on “A first chronology for the NEEM ice core” by S. O. Rasmussen et al.

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Comments to specific items of text are referenced as Pxxx Lyyy for Page xxx Line yyy

1 General Comments

Rasmussen et al. present an initial chronology of the NEEM ice core based on point-wise synchronisation with existing Greenland ice cores with absolute dating via the GICC05 time scale. This synchronisation is through manual matching of electrical conductivity measurements, dielectrical profiling and the location of tephra horizons between the NEEM and NGRIP ice cores.

Initial estimates of the gas age chronology and accumulation history are presented

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based on simple models. The models used are unable to produce consistent results for both the glacial and Holocene indicating that additional constraints are required.

The paper is well written and structured and presents sufficient supporting evidence. I recommend minor alterations and corrections detailed below.

2 Specific Comments

P2973 L18-23 A citation to a suitable reference or possibly some supplementary information would be useful to justify the statement that the Maximum Counting Error could be “regarded as the 2σ uncertainty of GICC05 in cases where Gaussian uncertainties are needed”. Specifically, information regarding the choice of the coefficient “2” in front of σ would be beneficial.

P2977 L8-10 As noted by the authors the section on processing of the NGRIP dielectrical profiling is missing from the manuscript (due to time constraints for consideration in the special issue) and needs to be included in the final manuscript.

P2982 L3 - P2983 L16 The interactive comment (C1207) by the authors dated 20 June 2013 notes that the apparent tephra mismatch discussed on P2982 L3 to P2983 L16 is no longer relevant and will be replaced in a future revision of the manuscript.

P2985 L15-22 The evaluation of the precision of the interpolated time scale considers interpolated age differences by the use of both linear and cubic spline interpolants. An easy additional estimate on the precision can be obtained as follows. For each match point, interpolate the age at the match point using only the match point immediately above and below and compare this interpolated age with the match point age from the GICC05 time scale. The magnitude of this age difference will be an upper bound on the error introduced by the interpolation scheme as the time span between the match points used in this interpolation with excluded match points is larger than when the

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excluded match point is included.

3 Technical corrections

P2969 L8 add “five” between “provide” and “additional”

P2970 L1 replace “take advantage of the” with “interpret”

P2970 L13 add “linear interpolation between” between “using” and “common”

P2971 L13 replace “variation, while in return,” with “variation. However,”

P2972 L7 replace “decrease further” with “are much thinner than Holocene thicknesses”

P2975 L7 delete the text “, and thus an elusive target indeed”

P2976 L27 replace “too low permittivity” to “permittivity significantly below this value”

P2979 L22 add the following text to the end of the sentence “ and five additional match points”.

P2989 L28 replace “make the model fit” with “minimise the RMS difference between the modelled ages and”. Replace “RMS” with actual minimisation method used.

P2993 L4 insert “five” between “add” and “additional”

P2993 L11 add “ice flow” between “the” and “model”

P2993 L12 change “or” to “of”

P2997 L23-27 Guillevic et al. is now published in Climate of the Past and this reference should be updated to reflect this.

P3000 L15-17 Is the Rosen et al. manuscript still in review? Can this reference be

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updated?

P3003 Table1 Caption needs updating to reflect reconciling of the tephra data.

P3006 Figure 3, note comment in caption about replacing figure when NEEM DEP data becomes available.

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