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Interactive comment on "Sea Ice Deformation in a Coupled Ocean-Sea Ice Model and in Satellite Remote Sensing Data" *by* Gunnar Spreen et al.

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We thank the reviewer for raising some points which seem to be unclear in our text. At this point we are not answering to the critics of the review directly but like to clarify two misunderstandings the reviewer, in our view, had and which therefore might be of relevance to other readers.

a) We do not consider the change in sea ice production/melt of the "weak" ice experiment in section 3.3 to be a thermodynamic process (and also do not write that in our opinion). We agree with the reviewer that this a combination of dynamic and thermodynamic effects. We agree with the reviewer and Steele et al. (1997) that dynamic ice thickening due to increased convergence for the weaker ice is causing the increased ice production, especially at the beginning of the experiment when the ice thicknesses

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is similar for all three experiments. As written in the introduction we want to add (not contradict) to the analysis of Steele et al. (1997) by also taking changes in ice export into account, which in our opinion was not done before. If the ice just would get dynamically thicker but the circulation, i.e., ice speed at the ice export gates would stay the same one would observe an increase in ice export. This is not the case. See also the discussion of possible different sea ice flow states in Hibler et al. (2006). The winter reduction in sea ice export as shown here is a positive feedback, which increases the sea ice volume for the weak experiment (in addition to initial dynamic sea ice thickening).

b) The ice deformation analysis in section 4 are not based on monthly statistics. All analysis use the simulated RGPS dataset described in section 4.2, which has an about 3-daily time resolution. We then aggregate all deformations over one month (e.g. in Figs. 4-6) to not show a single day or show a noisy time series (e.g. Fig 8) (could be changed to other time ranges if important but would not change the results).

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