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The Cryosphere Discussions

Interactive comment on "Initial sea-ice growth in open water: properties of grease ice and nilas" *by* A. K. Naumann et al.

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I found this is a useful and clearly written contribution. The many repeated experiments allow for a nice comparison between the forcing (air temperature) and the 'calorimeter method' is clearly a step forward in (lab) sampling. The close to constant solid fraction of the grease layer until it starts to consolidate seems to be a solid result.

I would like to challange the authors in comparing their findings more with results from the field. In Smedsrud and Skogseth (2006) we also found a close to constant solid fraction (Figure 7, the term 'Ice Concentration' was used there, but I agree that solid fraction is better). The mean found of the available field samples where 25.3%, quite close to your value of 0.25 from the lab.

Given that our normalized salinity (line 1-5, Page 141) was 0.75 compared to yours of 0.9, it is somehow surprising that the solid fractions match so well. We probably sampled grease that was older than a few hours, and there was probably more waves, so what would this imply for the Rayleigh number? Are our solid fractions two low because of using the 'salinity method'?

My feeling is that in the field there is more disturbance (wind, waves, currents) so that the brine drains more effectively, and may stay S br $\sim$ S w + 1 g/kg. This would then imply that both your lab based solid fraction value of 0.25 and the 25.3 % could be correct.

What I'm getting at is - what value should we use for the field ? Unless you come up with good reasoning to do otherwise I will use 0.25, I guess.

Interactive comment on The Cryosphere Discuss., 6, 125, 2012.