

***Interactive comment on “Antarctic summer sea ice concentration and extent: comparison of ODEN 2006 ship observations, satellite passive microwave and NIC sea ice charts” by B. Ozsoy-Cicek et al.***

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General Issues

1. The NIC ice edge is determined from the best available data, which may include various forms of high resolution satellite data, as well as passive microwave data. In regions, or on days, when no better data are available the NIC charts may only use the passive microwave data, in which case the NIC and AMSR ice edges will be the same. How often this happens I'm not sure, but a more critical look at what goes

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into compiling the NIC ice edge should be examined before too many conclusions are drawn about differences between the NIC and AMSR-E ice edges. The NIC ought to be able to provide some statistics on what goes into their ice edge products. The last sentence of section 2 claims the NIC is also an independent sensor;. This is not always true and it is not a sensor; it is a product.

2. Given (1) above, and the fact there is no consistent definition of the NIC ice edge, it is drawing a long bow to extrapolate the result from one cruise to the entire circumpolar sea ice zone. How can the authors be sure that the same data sets were used to compile the NIC ice edge in all regions of Antarctica, and that the difference observed in the study region applies to all areas of Antarctica? This could only be done by looking at the information used to compile the NIC charts, and this hasn't been done.

3. The authors make a series of confusing claims against the de la Mare whaling result. Firstly, they seem to confuse ice area with ice extent. In the abstract they claim that the underestimate of 14% in ice area from AMSR data alone accounts for more than half of the purported sea ice loss between the pre 1960s and the satellite era; however the whaling data was only used to examine ice extent, not area. Secondly, the authors claim that the NIC sea ice edge agrees well with the ship observations, while the AMSR-E shows the ice edge further south; which would lend support to the whaling result, which used the NIC charts, not just the passive microwave data. This is something that de la Mare has been very quick to point out in this debate, so I would strongly advise the authors to think about their claims in relation to the de la Mare result and to re-read his paper (and his follow up which is in press).

4. There is an assumption throughout the paper that the ship observations are always the correct data. This needs some justification, because critics will argue that the observations are subjective.

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## Specific Comments

Last sentence of Section 2.1. Values of ice concentration from the ship observations are given to 1 decimal place, yet the observations are only accurate to +/- 10%.

Section 3. Discussion of Figure 3. - It is a very brave person who would look at the scatter in this data and claim it shows a linear trend. While I'm sure Microsoft Excel will happily draw a line through any data set, it is worth standing back and asking whether it makes sense. Clearly in this case it does not and I don't believe the authors can claim there is any relationship between these two data sets. Why should there be given that an AMSR pixel represents 625 sq km and the ship observations represent about 5 sq km? Much of the other discussion of Figure 3 is perfectly valid and highlights some interesting features in the data - Figure 4 is introduced before the discussion of Figure 3 is completed and this is confusing for the reader. This should be revised. - Figure 4 is an interesting result. It would be valuable to say why you averaged the AMSR-E data, which is already coarse resolution

Section 3.2 heading and text. The authors describe "sea ice edge" and "sea ice extent"; as if they are two different things, which they are not. This continues into the next section as well.

Section 3.2, second paragraph. The description of the parallel lines drawn on the charts is extremely confusing. I have re-read it several times and I'm still not sure what has been done. The text claims "parallel lines are drawn along the ice edge". But in fact I think the lines must be drawn perpendicular to the ice edge. This section needs to be re-written so that it is a concise, accurate description of the data analysis.

Section 3.3, 10th line incorrectly claims that "summer is the time when the sea ice breaks into individual floes". In fact this is a process that occurs all through the year in response to ice dynamics.

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I'm not at all sure of the value of Figure 6, which shows plots of scatterometer data in the lower panels and AMSR data in the upper panels. The figure only receives a passing (1 line) mention which suggests a general agreement between scatterometer data and NIC data, which are not the data sets plotted.

The table captions should say what +ve and -ve values mean. For example a positive value indicates that the NIC ice edge is north of the AMSR-E ice edge. This would make the data much easier to understand.

Dates throughout should be in the international format (unless the journal specifies otherwise) which should be day/month/year.

There are quite a few grammatical errors but in light of the larger problems these can wait.

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Interactive comment on The Cryosphere Discuss., 2, 623, 2008.

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