The Cryosphere
Discussions

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Interactive comment on "A wavelet melt detection algorithm applied to enhanced resolution scatterometer data over Antarctica (2000–2009)" *by* N. Steiner and M. Tedesco

Anonymous Referee #1

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This paper presents a new wavelet based melt detection derived from high resolution satellite data over Antarctica. The paper is well written, self-consistent, innovative and fits with TC. The comparison with the previously published melt detection techniques is the most interesting, shows that uncertainty in the satellite derived melt extent remains relatively high and seems to suggest that simple threshold based techniques are likely the more reliable until now in the absence of reliable in situ melt measurements.

I suggest to accept this paper for publication if the authors can address the remarks listed below before publication.

Section 2.3, pg 2646, line 23: The authors tell that the melting events whose melt

duration < 3 days are removed. Why ? Is it also the case in the AWS measurements and in the SSM/I based melt time series ? Because the removal of these short melt events could impact a lot the comparisons afterwards.

Section 4.1: I suggest to put this section earlier in the text because it is strange to discuss the results of the new melt detection technique in Section 4.0 before validation with AWS measurements. It should be also very interesting to add in this comparison and in Fig 7 the M+30K and M09 SSM/I based technique to see which satellite data/melt detection algorithm compares the best with the AWS measurements and what is the interest of the QuickSCAT data (high resolution) in respect to the SMMI data (low resolution). It should be also interesting to add M+30K and M09 in Figs. 3-6 and in the discussion if it is not a too big job for the authors.

Section 4.2: This section is difficult to read and I suggest to put all the statistics listed in the text in a Table.

Section 4.3: I am very sceptical about the correlations plotted in Fig 10. because they were made over time series with 9 values only (2000-2009). For me, the time series are too short to perform realiable correlations and the correlations shown in Fig10 are not significant. It is likely that the differences between FT3 and CWT are just due to the noise in the 9 values time series. Therefore, I suggest to remove this section and to only focus this paper on the different melt detection techniques.