

Interactive comment on “Comparison of airborne radar altimeter and ground-based Ku-band radar measurements on the ice cap Austfonna, Svalbard” by O. Brandt et al.

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In their study Brandt and others compare the ASIRAS signal with ground-based radar and in-situ measurements. They use a retracker to pin down the actual ASIRAS signal from the surface; actually, from the uppermost 0–30 cm (p.787 l.15: the first returned peak is a convolution of the air-snow interface and the often stronger reflections from the upper ~30 cm), equivalent to attributing the "time-zero" to the radar signal. As an independent means to determine the surface they use ASIRAS reflections from several corner reflectors mounted at a known depth above the snow surface. I have the following comments/suggestions:

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- To my knowledge, a laser scanner onboard the airborne platform (type of which, as there are several, should be included in the manuscript for completeness) was operated simultaneously to the ASIRAS system. Analysis and inclusion of the laser-scanner data would provide an independent means to definitely pin down the surface elevation not only at a few single positions (like in the case of the corner reflectors) but all along the ASIRAS profiles, and thus obtain an independent check for the retracker time-zero and meet the "challenge to actually pinpoint the surface elevation within the received waveforms" (p.779 l.8).

- Apart from a better estimate of time-zero uncertainties, what scientific purpose would that serve? The authors state that the surveys were conducted in the "transition region from superimposed ice to firn, and two sites in the long-term firn area (wet-snow zone)." So far, comparable ASIRAS studies were only published (to my knowledge) for Greenlandic sites in the dry-snow and percolation zone, but neither for the superimposed-ice nor wet-snow zone. A comparison between the laser-scanner surface elevation and the ASIRAS (convoluted) surface return would therefore allow to pin down the variation of the depth range over which ASIRAS signals are convoluted to form the surface return signal also for the superimposed-ice and wet-snow zones. I think the study would profit from such an extension of its focus.

- Minor remark: in this context it would be helpful to (tentatively) outline the relevant glacier facies (compare Dunse et al., 2008) in Fig.1.

Interactive comment on The Cryosphere Discuss., 2, 777, 2008.

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