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The Cryosphere Discussions

Interactive comment on "Waveform analysis of airborne synthetic aperture radar altimeter over Arctic sea ice" *by* M. Zygmuntowska et al.

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General comments :

It's a well know fact that a back-scattering echoes of a radar signal depends on the sea ice properties, but only few papers have focused on the detailed examination of the relationship between observed waveforms and sea ice types. In this manuscript, authors apply Bayesian method for an airborne radar altimeter data for a classification of sea ice types. The approach is new and results are interested for a large scientific community, in particularly that the results could guidance for a development of a retrieval algorithm for the CryoSat-2 and other satellite sensors. The manuscript reads well, is free of errors and suits well for the topics of The Cryosphere. I suggest a publication after a minor revision.

Specific comments :

1) Motivation of this manuscript is to develop a method for a satellite sea ice classification, but data used in the analysis is from airborne measurements. Certainly, accuracy of the airborne measurements is much better than the CryoSat-2 altimeter measurements are and thus it would be good if the authors could also include some CryoSat-2 waveforms in their analysis or, at least, discuss more details on the accurancy of the CryoSat-2 SIRAL sensor and feasibility of applying the presented method for satellite data.

2) In page 1217, authors refer to Drinkwater et al (2004) when discussing on the CryoSat-2 mission, perhaps better reference would be :

Wingham D. J., Francis C.R., Baker S., Bouzinac C., Cullen R., de Chateau-Thierry P., Laxon S.W., Mallow U., Mavrocordatos C., Phalippou L., Ratier G., Rey L., Rostan F., Viau P., and Wallis D., CryoSat: A Mission to Determine the Fluctuations in Earth's Land and Marine Ice Fields. Advances in Space Research 37 (2006) 841-871.

3) In page 1222, authors cite Bayes and Price (1763), that's certainly original reference for the Bayesian classification method, but it's is better to cite for a some modern text book.

Interactive comment on The Cryosphere Discuss., 7, 1215, 2013.