Review of "Coherent backscatter enhancement in bistatic Ku-/X-band radar observations of dry snow" by Stefko et al

Main comments

The paper presents measurements of backscattering enhancement in snow by means of ground and space based Ku and X Band radar systems. The enhancement is a coherent "wave localization" effect through multiple scattering in a disordered microstructure. This effect is theoretically known for a long time, though it did not receive much attention in snow literature. To my knowledge, direct measurements of the enhancement peak in snow were never done before.

This is very creative and careful work and I recommend publication after a few minor things have been taken into account.

Kind regards,
Henning Löwe

Minor comments

(l73): This sounds as if CBOE may occur in pure water ice. I would mention the disorder here (e.g. porosity) too.

(l104): Its commonly termed *traditional* grain size.

(l115): missing spaces arount the hat symbol.

(l236): hat notation was already explained before.

(l298): Would be nice to state what's in fact the *meaning* of the porosity coefficient, besides giving its value.

(l.349): This information belongs rather into the method section.

(fig7): Maybe I missed it later in the discussion but what is the significance of the fact that Λ_T estimate in summer is roughly the same as Λ_T in winter? Since the backscattering enhancement is absent in summer, an interpretation of the summer data within this CBOE model should naively give an idea about the error of the parameters in winter. Why is the error on the length scale so drastically reduced?

(fig10): What does "supported by the horizontal gray line" mean in the caption? Is it a calculated line?

(sec 3.2.2): This is now a bit disappointing that no results are shown (in the main text) for the secondary observation site due to limited data. Why was the site chosen and introduced here at all? Maybe it should be dropped completely?

(l450): Was the corner reflector installed in summer?

(l445): "thickness of the snow layer" you mean snow depth?

(l448): "snowpacks thickness" $\rightarrow$ snow depth

(l494): Here, or before in sec 2.3, it would be helpful to discuss the relation of the effective transport parameters with the microstructure of the medium. What I grasp e.g. from Tsang, Ishimaru J. Opt. Soc. Am. A 1, 836 1984 is that the peak can be fully characterized by the effective (complex) wave propagation constant of the medium which can be computed from the two-point correlation function using common scattering approximations for snow. Is this sufficient or would a prediction of the profile (or prior estimates of the effective parameters) from in-situ measurements require more advanced structural information that is not yet measured in snow?