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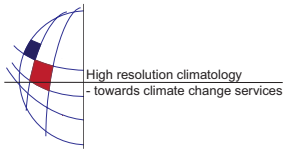

"Moving" Ground Clutter influence on Radar and Sodar measurements

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The ground clutter (fixed echoes) is due to the existence of the antenna side lobes (almost parallel to the ground) which generate spurious reflections with an energy level which can be well above the useful signal.

This ground clutter if generated by fixed obstacles which feed the acoustic spectrum in the receiving mode with an energy peak centered at zero Doppler shift. This can cause a dramatic underestimation of the measured wind speed.

An additional effect which is still not documented in the litterature is related to spurious reflections from moving obstacles. This is typically the case with reflections from the trees branches. In such case the ground clutter effect is no longer a peak centered at zero Doppler shift in the received acoustic spectrum (more or less spread because of the windowing technique and the effect of turbulence during the roundtrip of the sound). As the branches reach speeds of the order of the wind speed itself (of course higher when the branch goes downwind than when it goes upwind) the received acoustic spectra is filled by spurious energy in between the real signal and the zero Doppler shift frequency:

We will demonstrate that this effect may cause a significant underestimation of the wind component and this at all wind speeds. We will discuss how we correct this spurious effect.