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# SARAL/AltiKa observations for the studies of ice cover on lakes and oceans

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With the launch of SARAL/AltiKa satellite mission scientific community has now a new source of information to study ice cover on water bodies and oceans. AltiKa observations provide a continuity with the previous satellite radar altimetry observations from ERS-1, -2 and ENVISAT mission that have the same orbit. Moreover, with the new Ka-band altimeter it gives new insights into the ice cover structure and properties.

We present studies of ice cover on lakes (Lake Baikal) and Arctic ocean (for leads and polynyas detection). For Lake Baikal we use the synergy of simultaneous active (radar altimeter) and passive (radiometer) observations from radar altimetric satellites - SARAL/Altika and also TOPEX/Poseidon, Jason-1, ENVISAT and Geosat Follow-On. We present ice discrimination methodology from different satellite missions and discuss specificity of AltiKa observations. We analyse temporal variability of altimetric waveform parameters over ice-covered and ice-free surface for AltiKa and complement this analysis by satellite imagery (MODIS, Landsat), as well as our dedicated field observations of ice cover properties along the AltiKa tracks in spring 2013 and 2014.

For the Arctic ocean we investigate the performance of SARAL/AltiKa to detect the leads and the coastal polynyas as well as its ability to represent spatial and temporal dynamic of water openings. The method consists first in analysis of along-track radar waveforms with collocated high-resolution Landsat images in order to localise ice/water transitions. We discuss the potential of several techniques that could be used for leads and polynya studies and for freeboard estimation.

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