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SMOS over Antarctica - a short story of massive iceberg

E. Slominska, W. Marczewski, and J. Slominski
Space Research Center PAS, Warsaw, Poland (ewa@cbk.waw.pl)

By merging the SMOS land and sea L1C data, we obtain global maps of the brightness temperature at the top of the atmosphere at the L-band. This is a starting point for spatial and temporal analysis of the first Stokes parameter variations. One-year set of weakly averaged global maps of the first Stokes parameter clearly revealed dynamics of seasonal changes, especially at high latitudes and in the polar regions. It shows the changes in ice extent over Antarctica, ice melting in the Arctic Sea or the Hudson Bay.

Current studies are focused only on the Southern Hemisphere, mainly Antarctica and the region of the Ross Sea, where we were able to detect with SMOS one of the biggest icebergs ever recorded (B15J - part of the B15 iceberg). For nearly a year, the drifting iceberg was tracked on the SMOS data. An isolated, floating along Antarctica, set of 8-10 SMOS DGG pixels was a focal point for the present analysis. It was characterised by an excess in brightness temperature of approximately 30K, when compared to surrounding open water.

The derived iceberg motion indicated significant change of direction in the middle of September 2011, when the berg started to move equatorward. Straying from Antarctica, was accompanied with sequential decrease of the brightness temperature. At the end of December, the signatures of observed iceberg were barely apparent, making further tracking not feasible.

It is highly probable that SMOS documented the final stage of evolution of B-15J. So apart from the motion track and speed, we examine the variations of the brightness temperature, as well as polarimetric characteristics of the spotted iceberg.