

# COMPARISON OF HELICOPTER-BORNE THIN SEA ICE THICKNESS PROFILES WITH POLARIMETRIC SIGNATURES OF DUAL-POL TERRASAR-X DATA

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Polarimetric SAR data may form a promising tool for monitoring thin sea ice thickness from space. During the Russian-German Transdrift XIII expedition in the Lena delta area in the Russian Arctic in May/April 2008, data sets of TerraSAR-X data in HH-VV Dual-Pol Strip Map mode, as well as coincident helicopter-borne sea ice thickness profiles could successfully be acquired within the footprint area of the satellite imagery. This gives the opportunity to test the potential of polarimetric SAR data for sea ice thickness retrieval directly.

The measurement activities were organized and conducted by the Arctic and Antarctic Research Institute (AARI), St. Petersburg, Russia, the Institute of Marine Sciences (IFM-GEOMAR), Kiel, Germany, and the Alfred Wegener Institute (AWI) for Polar and Marine Research, Bremerhaven, Germany. The sea ice thickness profiles were acquired during an intensive ground measurement campaign by means of AWI's EM-Bird sensor, involving a helicopter borne EM induction sounding techniques.

The single look complex SAR data undergo polarimetric processing, that includes the calculation of entropy, alpha angle, and the eigenvalues of the scattering matrix. Due to a time lag of both data acquisitions ice drift correction is of enormous importance before extracting signatures from the SAR data along the sea ice thickness profile tracks. The first results of the comparison of X-band SAR data and sea ice thickness profiles corrected for ice drift are presented in this study