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AMSR-E Geolocation and Validation of Sea Ice Concentration 89GHz Data

[Georg HEYGSTER](#)¹⁾, [Heidrun WIEBE](#)¹⁾, [Gunnar SPREEN](#)²⁾ and

1) Institute of Environmental Physics, University of Bremen

2) Institute of Oceanography, University of Hamburg

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Abstract

Sea ice concentrations based on AMSR-E 89GHz data are unprecise due to the limited data timeliness (about 6 hours after overflight), horizontal resolution and lack of global coverage. Here the geolocation of the AMSR-E Level 1 data (under the time constraints) is corrected and the sea ice concentrations are geolocated. The geolocation adjusts the cone angle and scan angle of AMSR-E's cone scan based on the comparisons of the jump of the AMSR-E brightness temperature

coastlines with a global landmask. The average residual error increased from 89GHz channels to 1425m in the 6GHz channels. The ice concentration algorithm (ARTIST (Arctic Radiation and Turbulence Interaction Study) Sea Ice Concentration Algorithm) which is an enhancement of the Svendsen 85GHz algorithm. Results of four types of comparisons of the ASI/AMSR-E ice concentration algorithm: (1) Arctic ship based bridge observations of RV Polarstern, (2) optical multispectral imager ETM+ operating on Landsat-7, (3) Envisat Advanced Very High Resolution Radiometer images and (4) two other AMSR-E sea ice concentration algorithms (NASA Team 2) which use the 19/37GHz channels. In spite of the different wavelengths and interaction principles of the electromagnetic radiation, they yield a rather consistent picture. On average the ASI ice concentration is slightly higher than those of the NT2 algorithm, applied to the same hemispherical (Arctic and Antarctic) comparisons of the ASI results with NASA Team 2 and Bootstrap concentrations, the biases do not exceed 7 and 11% ice concentration.

Keywords: [AMSR-E](#), [Microwave](#), [Geolocation](#), [Sea ice](#), [Validation](#)

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