THE VALUE OF ACTIVE MICROWAVE SATELLITE DATA FOR MONITORING HIGH LATITUDE ENVIRONMENT

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ABSTRACT:

Scatterometer and ScanSAR are active microwave (radar) sensors which provide daily to weekly measurements at high latitudes with coarse to medium spatial resolution. They are cloud cover independent and the differences in backscatter reflect changes at the earth surface which are especially of interest for hydrological applications. For high latitude relevant parameters include snow surface melt, freeze/thaw status, soil moisture and inundation. Apart from river discharge, they play a role for e.g. permafrost and wild fire occurrence. Active microwave satellite data are explored for use in permafrost studies within the ESA DUE Permafrost project. A comprehensive satellite products database is setup within the framework of this project which is part of the Data User Element (DUE) program. A monitoring system on local to pan-boreal/arctic scale is established based on a variety of satellite products. www.ipf.tuwien.ac.at/permafrost This paper focuses on the potential of ENVISAT ASAR (150m-1km) and Metop ASCAT (25km) data for permafrost monitoring. Both sensors provide information on near surface soil moisture variations and surface freeze/thaw status. Continuity is ensured for both systems: with the Sentinel-1 mission in case of ENVISAT ASAR and Metop-A is the first of a series of three satellites.

TOPIC: Microwave remote sensing
ALTERNATIVE TOPIC: Remote sensing applications

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