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30 years of scatterometer soil moisture research at TU Wien: What's next?

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Scatterometer soil moisture research started at the Vienna University of Technology (TU Wien) 30 years ago when attempting to use the first European C-band scatterometer flown on board of the ERS-1 satellite for wet snow mapping over the Canadian Prairies. While it quickly turned out that the detection of wet snow is impossible when the snowpack is shallow, the strong link between C-band backscatter and soil moisture under snow-free conditions became evident [1]. This motivated research on how to disentangle the backscatter contributions from soil moisture and vegetation, which cumulated in the public release of the first global satellite derived soil moisture data set in 2002 [2]. Despite the strong criticism that the scatterometer derived soil moisture data depict in reality only vegetation signals that happen to be correlated with soil moisture dynamics, the positive outcome of independent validation studies led to the decision by EUMETSAT to develop a near-real-time soil moisture service for the Advanced Scatterometer (ASCAT) flown on board of the METOP satellites. This service, being the first of its kind, became operational in 2008, and was later integrated into the Satellite Application Facility for Support to Operational Hydrology and Water Management (H SAF). For continuously improving this ASCAT service, TU Wien has carried out extensive research to quantify the soil moisture retrieval errors and improve the retrieval algorithm and workflows. In this presentation, I will provide an overview of the main developments over the past years, discuss open research challenges, and provide an outlook to the next ASCAT product releases and the upcoming, next-generation scatterometer instrument called SCA, to be flown on the Metop-SG B-satellites.

References

[1] Wagner et al. (1995) Application of Low-Resolution Active Microwave Remote Sensing (C-Band) over the Canadian Prairies, in Proc. of the 17th Canadian Symposium on Remote Sensing, Saskatoon, Saskatchewan, Canada 13-15 June 1995, 21-28.

[2] Scipal et al. (2002) The Global Soil Moisture Archive 1992-2000 from ERS Scatterometer Data: First Results, In: Proceedings IEEE Geoscience and Remote Sensing Symposium (IGARRS2002), Toronto, Canada, 24-28 June 2002, 1399-1401.