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## **The Integration of SMOS Soil Moisture in a Consistent Soil Moisture Climate Record**

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Recently, a study funded by the European Space Agency (ESA) was set up to provide guidelines for the development of a global soil moisture climate record with a special emphasis on the integration of SMOS. Three different data fusion approaches were designed and implemented on 10 year passive microwave data (2003-2013) from two different satellite sensors; the ESA Soil Moisture Ocean Salinity Mission (SMOS) and the NASA/JAXA Advanced Scanning Microwave Radiometer (AMSR-E). The AMSR-E data covered the period from January 2003 until Oct 2011 and SMOS data covered the period from June 2010 until the end of 2013.

The fusion approaches included a neural network approach (Rodriguez-Fernandez et al., this conference session HS6.4), a regression approach (Wigneron et al., 2004), and an approach based on the baseline algorithm of ESAs current Climate Change Initiative soil moisture program, the Land Parameter Retrieval Model (Van der Schalie et al., this conference session HS6.4). With this presentation we will show the first results from this study including a description of the different approaches and the validation activities using both globally covered modeled datasets and ground observations from the international soil moisture network. The statistical validation analyses will give us information on the temporal and spatial performance of the three different approaches. Based on these results we will then discuss the next steps towards a seamless integration of SMOS in a consistent soil moisture climate record.

### References

Wigneron J.-P., J.-C. Calvet, P. de Rosnay, Y. Kerr, P. Waldteufel, K. Saleh, M. J. Escorihuela, A. Kruszwski, 'Soil Moisture Retrievals from Bi-Angular L-band Passive Microwave Observations', *IEEE Trans. Geosc. Remote Sens. Let.*, vol 1, no. 4, 277-281, 2004.