

Satellite inspired hydrology in an uncertain future: a H SAF and HEPEX workshop



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Retrieval of soil moisture using neural networks

Thursday, 28 November 2019 09:40 (20 minutes)

A retrieval methodology based on Neural Networks was proposed (Aires et al. 2005) to retrieve and assimilate Soil Moisture (SM) from satellite observations. It is based on the fact that no radiative transfer model was satisfactory enough for a physically-based algorithm. An innovative aspect is to train the NN using modelled SMs. The resulting retrievals are not a reproduction of the model: the temporal and spatial variability is driven by the satellite observations and retrievals can actually correct erroneous models (Aires et al. 2005; Jimenez et al. 2013). The algorithm can work with passive or active microwave observations and the NN is able to combine them to exploit their synergy (Kolassa et al. 2013; 2016; 2017). This approach has been developed using recent instruments (e.g. SMOS, Rodrigues et al. 2015). The scheme uses implicitly a general CDF matching (at the global scale) that facilitates the assimilation of the retrieved SMs; avoiding traditional pixel-based CDF matching that modifies the satellite spatial patterns towards the model. Assimilation of the retrieved SM was recently tested at ECMWF using SMOS data (Rodriguez et al. 2018) and downscaling of coarse resolution SMs has been successfully performed (Alemohammad et al. 2018).

Which session would you like to present in?

Primary author: AIRES, Filipe (LERMA / Observatoire de Paris / CNRS)

Co-authors: PRIGENT, C (LERMA, Observatoire de Paris / Estellus); RODRIGUEZ-FERNANDEZ, Nemesio (CESBIO); KOLASSA, Jana; JIMENEZ NAVAJO, Carlos (AEMET); DE ROSNAY, Patricia (ECMWF); KERR, Yann

Presenter: AIRES, Filipe (LERMA / Observatoire de Paris / CNRS)

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