Use of local ancillary data to improve global SMOS Level 2 soil moisture product over crop areas of Argentina

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Surface soil moisture plays a key role in many water and energy balance models. Several remote sensing retrieval algorithms based on passive microwave observations have been applied to estimate surface soil moisture. Low frequency observations are optimal for soil moisture retrievals because of their high sensitivity to soil moisture. Therefore, it is highly relevant to study the soil moisture product of the current L-band SMOS satellite mission. In general, in order to assess the performance of the retrieval algorithm to estimate soil moisture, retrieved soil moisture values are compared against ground soil moisture measurements. However, to this end, intensive field work and a extend network of weather stations is required, especially to match spatial and temporal resolutions. Consequently, some techniques have been developed to overcome this obstacle, such as the triple collocation approach and the data assimilation-based Rvalue approach [1].

The objective of this work is the implementation of the Rvalue technique to SMOS retrieved soil moisture in order to evaluate SMOS L2 global soil moisture product over a relevant crop area of the rolling pampas, Argentina.

In addition, a new soil moisture estimation will be derived by replacing the global land cover map used in the SMOS Soil Moisture Level 2 Prototype Processor (SML2PP), with a local land cover provided by the National Institute of Agricultural Technology (INTA) generated through the FAO Land Cover Classification System (LCCS). As in the previous case, Rvalue approach will be implemented to assess the performance of assimilating the local-land cover-based soil moisture product into a simple linear water balance model.

Finally, both Rvalue metrics obtained will be contrasted to explore whether if a significant improvement can be achieved by making use of a more accurate land cover map on the SMOS retrieval soil moisture algorithm.

References

[1] Crow, Wade T., 2007: *A Novel Method for Quantifying Value in Spaceborne Soil Moisture Retrievals*. J. Hydrometeor, 8, 56–67. doi: http://dx.doi.org/10.1175/JHM553.1