SMOS AND RFI: A LONG STORY

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The SMOS mission was launched in November 2009 and allows measuring the surface soil moisture over continental land and sea surface salinity, covering the entire surface in 3 days. Over land, the multi-angular algorithm also enables to estimate the vegetation opacity which is directly related to the water content of the canopy.

However, the SMOS radiometer operates within the Earth Exploration Satellite Service passive band at 1400-1427 MHz . Since its launch in November 2009, SMOS images have been strongly impacted by Radio Frequency Interference (RFI). So far approximately 500 RFI sources distributed worldwide have been detected. Some of the strongest RFI sources might mask other weaker RFI underneath, hence it is expected the total number of RFI detected may increase as strong ones are progressively located and switched off. Most RFIs are located in Asia and Europe, which together hold approximately 80% of the active sources and more than 90% of the strongest interference. The areas affected by RFI may experience either an underestimation in the retrieval values of soil moisture and ocean salinity or data loss, with the associated detrimental impact in the scientific return.

To be able to make optimal use of the data a two prongs approach was set up. On the one hand we endeavoured to identify, localise, and report sources. On the other hand we applied many approaches to identify and filter the corrupted data. The approaches are applied at different levels (level1 to level 3) using for each level their specificities. To end up with regularly updated RFI maps. We will present the SMOS specificities wrt RFI impact as well as the different detection and flagging approaches together with specific examples of detection in complex environments.