**Status of Salinity Remote Sensing: SMAP**

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**Extended Abstract**

The RSS SMAP Version 2 sea surface salinity (SSS) data have been released on September 13, 2016 [1,2]. Our talk discusses the major steps of the SMAP salinity retrieval algorithm, including updates and improvements from the Version 1 (BETA release). We also provide validation results against ground truth measurements from ARGO drifters.

Though designed for measuring soil moisture, the SMAP radiometer has excellent capabilities to retrieve SSS with a similar accuracy as Aquarius. However, the calibration accuracy of the SMAP L1 Version 3 brightness temperatures [3] on which the SMAP soil moisture product is based, is itself not sufficient for retrieving SSS, but additional steps need to be taken. These steps will be discussed in our presentation.

Other than Aquarius, the SMAP antenna is slightly emissive. The value of the emissivity is approximately 1%, which is 4 times as large as anticipated from ground calibration. This causes significant spurious biases in the SMAP salinity data that correlate with the physical temperature of the antenna, which depends on solar heating. It is necessary to develop a correction for this spurious emissivity signal.

Due to the demise of the SMAP radar, SMAP does not provide valuable L-band scatterometer wind speeds at the same location and time as the radiometer observation as Aquarius did. Therefore, the SMAP salinity retrieval algorithm needs to use wind speeds from WindSat and F17 SSMIS for correcting the surface roughness effect.

The full 360° look of SMAP makes it possible to take observations from the forward and backward looking direction basically at the same instance of time. This two-look capability strongly aids the salinity retrievals. It is possible to observe some of the spurious contamination sources such as the reflected galaxy or the reflected sun from different directions and thus determine the size of these signals.

We also discuss further steps towards the next Version 3 SSS release. After the algorithm for the Aquarius Version 5 release has been finalized, we need to make the retrieval algorithms for SMAP and Aquarius as consistent as possible. In addition, the correction for emission from land surfaces that is currently used in SMAP Version 2 needs to be improved.

**References**

