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The AltiKa/SARAL mission is a complement of the Jason altimeter series. The use of a Ka band altimeter results in better performances in terms of spatial resolution and accuracy. A two-channels microwave radiometer (23.8 and 37 GHz) is combined to the altimeter in order to correct the altimeter range for the excess path delay resulting from the presence of water vapour in the troposphere. Brightness temperatures are also used for the estimation of the atmospheric attenuation of the backscattering coefficient, that is significant in Ka band. The radiometer performs measurements of brightness temperatures in both bands at the location of the altimeter footprint.

First results at instrumental level exhibit its very good thermal stability, its very fine sensitivity and its sharp spatial resolution, making of AltiKa radiometer one of the best in-flight radiometers.

Concerning the brightness temperatures, in-flight calibration during the commissioning phase aims at providing quantitative information on the accuracy and the precision of their measurements. In a long term point of view, it will be used to assess the stability of the instrument. However, the main difficulty for microwave radiometry lies in the lack of references: natural targets are neither well-known nor homogeneous enough and each in-flight instrument has its own calibration strategy. We have therefore based the calibration of AltiKa radiometer on a combination of comparisons to other instruments (AMR on Jason-2, AMSU-A) directly over specific areas (Amazonian forest, Antartica). Over ocean, double-differences using simulations as a common reference (using ECMWF analyses and UCL radiative transfer model) are used to compare AltiKa radiometer to other instruments.
We will present here the first results of the AltiKa in-flight calibration based on such comparisons.
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