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The launch of the SARAL satellite last February added a new tyke to the string of altimeters that has been operating continuously since 1991. While its orbit mimics that of ERS-1, ERS-2 and Envisat, its altimeter instrument, AltiKa, does none of that. AltiKa is the first Ka-band altimeter, and is also the first to provide 40-Hz elementary measurements, twice the rate we were used to. With a smaller footprint, higher range precision (even at 40-Hz) and higher range rate, everything appears cued to provide an excellent altimeter, particularly for applications where along-track high resolution matters. The high spatial resolution of the 35-day repeat orbit is an additional bonus over the 10-day repeat orbit of the Jason series.

The novelty of the altimeter as well as the radiometer causes some setbacks too: we need to totally relearn how to deal with the impact of the atmosphere. For example, the absorption of the signal by the dry troposphere is about 3 times as large in Ka-band as in Ku-band. The absorbtion by water vapour and cloud liquid water is even 6 to 7 times larger than we have been used to. In addition, the new radiometer design requires the development of new neural network algorithms for the determination of the parameters generally derived from the radiometer brightness temperatures, i.e., wet tropospheric path delay, backscatter attenuation, water vapour content, and liquid cloud water vapour.

The relationship between backscatter and wind speed in Ka-band also departs from that in Ku-band. We thus developed our own 1- and 2-dimensional wind speed models. Likewise, the sea state bias is expected to differ from what we have traditionally used.

This presentation highlights some of the “novelty” aspects of SARAL. We will show some of the recent developments to improve or enhance the SARAL data sets, evaluate the quality in terms of the inclusion in a climate data record, and give some detailed views of SARAL’s performance over the global oceans.
OSTS session
Regional and Global CAL/VAL for Assembling a Climate Data Record
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