
An empirical antenna gain estimation method for SWIM sigma0 correction

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Résumé

The originality of SWIM remains in the acquisition of the surface backscattering for 6 elevation beams in all azimuths, thanks to a rotating antenna. For such measurements, the antenna gain is an important parameter in the signal correction processing, and allows to compute sigma0 profiles with respect to elevation for each beam.

The antenna gain is measured once on-ground in several azimuth directions of the antenna, and used in the level-1A processing to correct the signal from the antenna contribution. During the CALVAL phase, we however noticed that the measurement precision of the antenna gain has reached its limits, with a significant impact on the sigma0 profiles in the same azimuth area of the rotating antenna: sigma0 profiles become more and more concave, instead of remaining close to a 2^o polynomial function with respect to elevation.

An empirical method was thus developed, and is presented here to correct the measured antenna gain in this azimuth sector, where its measurement precision is not sufficient. Once applied to the measured signal, it is shown that this adjusted antenna gain is adapted in all the azimuth directions, and eliminates all the concave-shaped sigma0 profiles.

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