

CALIBRATION OF FULLY POLARIMETRIC RADIOMETERS: THE LAURA
RADIOMETER

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During the 90's polarimetric radiometers with capability to measure the four elements of the Stokes vector (τ_V , τ_H , U and V) have shown their potential to measure the ocean wind direction. More recently, polarimetric signatures have also been measured for hydrometeors, and probably other natural and man-made bodies will exhibit this behavior too. The amplitude of the azimuthal signature of the four Stokes elements is very small (~ 1 K), therefore the usefulness of polarimetric data and relies on an accurate calibration of the radiometer, which poses new challenges to be addressed.

Interferometric radiometers and polarimetric radiometers using a complex correlator to measure the third and fourth Stokes elements (U and V) present many common aspects. In addition, imaging interferometric radiometers, such as the MIRAS instrument aboard the SMOS mission can be operated in a polarimetric mode. The similarities between a single baseline of an imaging interferometric radiometer and a polarimetric radiometer will be presented. The error propagation equation will show that most errors are common to both systems and therefore can be corrected by similar techniques.

To improve the sea salinity retrieval algorithms for the SMOS mission, the European Space Agency (ESA) is supporting a one-month field campaign (WISE-2000) at the Casablanca oil platform to gather L-band radiometric data of the sea surface under the widest possible range of conditions. The Polytechnic University of Catalonia (Barcelona, Spain) will contribute to this campaign with a fully polarimetric radiometer with azimuth and elevation scan capability named LAURA (L-band AUtomatic RAdiometer). LAURA's block diagram will be described and the similarities between its calibration scheme by injection of correlated/uncorrelated noise and the MIRAS calibration will be emphasized.