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SMOS Payload Pre-Launch Performance

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SMOS is ESA's second Earth Explorer mission with the objective of producing global maps of Soil Moisture and Ocean Salinity over the Earth. It will fly a single payload, MIRAS, the first-ever spaceborne L-band Microwave Imaging Radiometer with Aperture Synthesis in two dimensions. The performance requirements of MIRAS are demanding in terms of spatial resolution, accuracy, stability and precision, all critical to fulfil its scientific objectives. During the ground test campaigns both at payload and satellite levels the performance of the instrument was checked against the original system requirements. The verification of the requirements, written in terms of brightness temperatures (Level-1 data), included some image processing of the raw correlations (Level-0 data) acquired inside an empty anechoic chamber. All requirements are satisfied with some margin. This presentation will include a description of the Level-1 performances to be met by SMOS, the measurement configurations and methods with which they were verified, and the final results. The Level-1 instrument performance, given mostly at snapshot level for a 50 km spatial resolution, is then propagated to the equivalent accuracy in the Level-2 geophysical parameters, soil moisture and sea surface salinity, assuming one full overpass and simplified models.