CALIBRATION/VALIDATION of ERS-2 ALTIMETRY

Jerome BENVENISTE
European Space Agency/ESRIN
Via Galileo Galilei,
I-00044 Frascati Rome, Italy
(Jerome.Benveniste@esrin.esa.it)

A Commissioning Working Group has been constituted in order to commission and calibrate the Radar Altimeter (RA) and Microwave Radiometer (MWR) on ERS-2. The activities covered by this Group are:

- RA instrument in-orbit functional verification
- Validation and use of the ERS-2 RA Fast Delivery products
- RA instrument calibration using the Fast Delivery products (URA/QLOPR)
- RA instrument calibration using the Final Precision products (OPR)
- MWR-2 instrument calibration
- Coordination with PRARE commissioning activities at GFZ-Potsdam.

(1) Calibration of Range
The RA calibration method is based on the global comparison of ERS-1 and ERS-2 data at crossover points, along collinear tracks, as well as comparison of Mean Sea Surface models produced from the two altimeters. Cross-calibration of ERS-1 and ERS-2 range for Ice mode is also performed with a specific set of ice mode data over ocean. A preliminary electromagnetic bias for ERS-2 and a datation bias was estimated. The objective was to get an estimate of the relative bias between ERS-1 and ERS-2 with an error bar of less than 5 cm with 3 35-day cycles of data.

(2) Calibration of Sigma-Nought / Wind Speed
Two methods were envisaged to get calibration coefficients, with error estimates: a statistical comparisons of ERS-1 versus ERS-2 sigma-nought and a statistical comparison of ERS-1 and ERS-2 wind speed with ECMWF wind and in-situ data

(3) Calibration of Significant Wave Height.
Three methods were envisaged to get calibration coefficients, with error estimates: a comparison with the WAM model, with buoys and with ERS-1.

The ERS-2 RA & MWR Commissioning Working Group have performing the work described above and have reviewed the results. Concerning the range, the Fast Delivery data, as well as the Precision OPR data-but with better precision, show that the relative range bias is not significantly different from zero. The ERS-2 sigma-nought is aligned on ERS-1 and calibration coefficients have been estimated for SWH.