

3. Calibration Methodology

Calibration of ERS and ENVISAT SAR Using Large Parabolic Antennas

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Poster session

The goal of the report is an analysis of first results of ERS SAR and ENVISAT ASAR calibration in the area of Bear Lakes calibration site using under extension of AO3-343 project.

The area of study is calibration site in Moscow region with parabolic antennas (4.8 meters diameter of the dish), which were used over 5 years as calibration target. Our previous analysis of amplitude and phase in the ERS SLCI data has shown very high stability of RCS for both artificial (antennas) and natural (surface structures, urban constructions) targets.

New stage of current study is focussed on the radiometric, phase and polarization properties of the scatterers mentioned. An appropriate modification of ground-based parabolic antennas was made in a form of insertion conducting disks and diffraction grid in antenna focal area. Of highest importance is the fact that parabolic antenna equipped with diffraction grid consisting of a set of metal wires is able to control polarization plane of backscattered electromagnetic wave with linear polarization.

During fall of 2003 a set of simultaneous observations of Bear lakes calibration site with ERS and ENVISAT was conducted. Various calibration scenarios based on parabolic antennas were provided. Among the targets there was antenna with diffraction grid oriented at the predefined angle with respect to polarization plane. The observations made are good basis for a conclusion about polarization properties of ENVISAT. Comparative analysis of ERS and ENVISAT measurements of ground based antenna RCS is a chance for intercalibration.

We foresee to get results on the phase stabilities of large antennas using ENVISAT data as it was done before with ERS AMI data.