

Seminar über Microwave Physics and Atmospheric Physics

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Titel: Radiometric Transmission and Reflection Measurements of Mesh Reflector Samples for the Copernicus Imaging Microwave Radiometer

The Copernicus Imaging Microwave Radiometer (CIMR) mission will observe sea surface temperature, sea ice, and sea salinity in five frequency bands between 1.4 and 36.5 GHz. The instrument will be equipped with a 8 m large deployable mesh reflector antenna. For absolute radiometric calibration of the observations, it is essential to determine the Ohmic loss and the transmissivity of the metal mesh material used to form the RF reflective surface of the parabola with high accuracy. Initial radiometric tests were performed on a 40 x 40 cm sample, representative of one of the possible mesh definitions for CIMR, at an incidence angle of 45 degrees in reflection and in transmission against the cold sky in zenith direction using the HATPRO radiometer. The uncertainties of the reflection measurements are driven by the temporal variability of the sky brightness temperature, while the transmission measurements are affected by temperature changes of the microwave foam absorbers used to terminate the reflected and transmitted signal path. An Ohmic loss of about 1 % is observed, which did not depend much on the manufacturing direction of the mesh. In contrast, the transmission properties exhibit an orientation dependency of around 0.5 % between the measurements when the plane of incidence is parallel or perpendicular to the manufacturing direction. The transmission of the sample was also found to be frequency dependent, where the transmission increases towards higher frequencies, which aligns with GRASP simulations.

Zeit: Friday, 06.12.2024, 10:15 Uhr

Ort: Room A97
<https://unibe-ch.zoom.us/j/97081325603?pwd=d0ozME5xOS9pQVNxallLem81VHQyZz09>
Meeting ID: 970 8132 5603
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