Geophysical parameter retrievals using combined GNSS-R, microwave radiometry and VNIR observations with the FSSCat mission: A Neural Network Approach

Camps, Adriano[1]; Munoz-Martin, Joan Francesc[1,2]; Llaveria, David[1]; Herbert, Christoph[1]

1 Universitat Politecnica de Catalunya, Spain

2 Jet Propulsion Laboratory, CA, USA

Abstract

FSSCat is a two 6U CubeSats mission, winner of the ESA S3 challenge and overall winner of the 2017 Copernicus Masters Competition. It was launched on September 3rd, 2020. The first satellite, 3Cat-5/A, carries the FMPL-2 instrument, an L-band microwave radiometer and a GNSS-Reflectometer, while 3Cat-5/B carries HyperScout-2, a VNIR and TIR hyperspectral imager.

This work presents a neural network approach to retrieve in the Arctic and Antarctic oceans, sea ice concentration, extent, and thickness, as well as sea salinity and wind speed maps; and in the Northern hemisphere surface soil moisture, all using FMPL-2 data.

Results from the first months of operations are presented and analyzed, and the quality of the retrieved maps is assessed by comparing them with other maps. Retrieval errors using different combinations of parameters will be presented and discussed.