

Project:

Passive Advanced Unit (PAU): A Hybrid L-band Radiometer, GNSS-Reflectometer and IR-radiometer for Passive Remote Sensing of the Ocean

Objectives:

- Scientific:

- Ocean monitoring by passive remote sensing.
- To improve our understanding of the characteristics of Global Navigation Satellite Signals (GNSS) reflected over the sea to reliably retrieve sea state information (significant wave height, altimetry and sea surface rms slope)
- To improve our understanding of the relationship between L-band brightness temperature and sea state, to perform the required corrections for sea surface salinity retrieval from space.

- Technological:

To achieve these goals a PAU sensor will be developed. It will be a ground-based and airborne demonstrator of two new technologies that may play a key role in future operational oceanography from satellite:

- GNSS-Reflectometry, used for sea state determination (sea surfaces's slope), altimetric measurements and integrated electron content estimation, and
- L-band radiometry, where there is maximum sensitivity to sea surface salinity (SSS).

An IR radiometer is also required for sea surface temperature (SST) estimation in SSS retrieval

The instrument concept is a hybrid L-band radiometer + GNSS-Reflectometer using a common antenna array, sharing the same RF front-end and samplers. Different beams at different incidence angles, with different widths and side lobes so as to satisfy the radiometer and GNSS-R specifications will be created by an array of digital beamformers.

Comments:

Novel measurement approach with multiple instruments and a new modeling approach. From hardware (sensors & modeling) to applications (ocean and climate) is cross-disciplinary.

Has already demonstrated leadership as PI of a number of ESA projects. Impressive publication record with 41 journal papers and 70 conference papers. Internationally recognized work. His PhD has impact on new ESA satellites.

An ambitious project, with clear objectives and milestones which can be benchmarked continuously. Good international collaboration. The developed methods will give a new understanding of ocean modeling and the impact of the oceans on global climate.

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