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ESA's Campaign Activities in Support of Earth Observation Projects: A focus on validation

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In the framework of its Earth Observation Programmes the European Space Agency (ESA) carries out ground based and airborne campaigns to support geophysical algorithm developments, calibration/validation activities, simulation of future space-borne earth observation missions, as well as application developments related to remote sensing of the atmosphere, land, oceans, solid earth and cryosphere.

ESA has conducted over 150 airborne and ground based measurement campaigns in the last 37 years, of which more than 80 were carried out since 2005. During this period a large number of campaigns have supported the validation of ESA's satellite missions including for example SMOS and CryoSat. Ongoing activities are focusing on e.g. Sentinel-5Precursor and the preparation of upcoming Earth Explorer missions such as BIOMASS, FLEX, and FORUM. These validation campaigns aim to provide fundamental information about the confidence of data products and their required uncertainties One challenge in this context is a comprehensive understanding and characterization of measurement uncertainty of the validation dataset and the spatial and temporal support or representativity of these.

We will provide an overview of applied strategies to tackle these aspects for existing satellite missions and outline concepts for future missions, and how these integrate into broader earth observation science strategies. In addition, we will highlight recent activities and outline planned activities for the coming years.