



Remote Sensing of Vegetation Fluorescence from Space within the ESA Earth Explorer Programme

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Fluorescence Imaging Spectroscopy has been considered by ESA already since many years. Resulting from a call for ideas for the 7th Earth Explorer mission, the Fluorescence Explorer (FLEX) mission was selected for assessment as one of the six Earth Explorer mission candidates to be studied within Phase 0. Although not selected for further study within the 7th Earth Explorer core mission, it has now been proposed in a new configuration that is making use of the synergy with existing missions by flying in tandem with another satellite, nominally with Sentinel-3. ESA has recently selected the mission concept for further (Phase A) feasibility study as one of the two candidates of the 8th Earth Explorer opportunity mission.

In order to optimise the return of the scientific exploration of vegetation fluorescence from space with the proposed concept, it is necessary to investigate possible configurations that are based on the tandem approach. In the frame of an instrument preparatory development study we have made a first step into this direction and iterated the concept of measuring fluorescence from space to derive the expected instrument specifications that would allow us to determine the instrument concept. We have thereby identified an improved retrieval algorithm which is making use of the full fluorescence signal information being accessible from space while accounting for the atmospheric corrections being required to achieve sufficient measurement accuracy. The possible configurations of a remote sensing instrument, a Fluorescence Imaging Spectrometer, have been derived and adapted to such an improved measurement strategy.

We will present the basic measurement concept and objectives, the status of the possible instrument configurations that are in line with the measurement objectives, and we will present an outlook to the activities that will be carried out within the frame of the Earth Observation Programmes.