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PASTRI - Pilot for Aerial Surface Temperature Retrieval

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PASTRI will be a joint pilot study of ConstellR, GFZ Potsdam and FU Berlin for airborne based aerial surface temperature retrieval. The mission is planned as a preparation and demonstrator mission for the upcoming spaceborne thermal satellite microsattelites of ConstellR. ConstellR will provide a land surface temperature (LST) monitoring service with an initial focus on companies in the precision farming industry. The initial minimal viable constellation (MVC) of four microsattelites will offer global, daily LST monitoring at 50 m spatial resolution with 1.5 K radiometric accuracy for a monitoring area capacity comparable to the size of Germany's agricultural area.

The authors intend to use a six-week airborne campaign in May/June 2021 as a data delivery pilot to develop and validate the provision of an LST product. In total 18 flights are planned (3 flights/week every second week, 2 flights/day) with the FU Berlin Cessna T207A. On the technical side, the project includes the payload development and adaptation to the mechanical interface of the airplane, the actual (airborne) recording or imagery, as well as setting up the data processing pipeline. The aircraft will be instrumented with an adapted ConstellR Sensor and a thermal hyperspectral Telops HyperCam. This enables a performance evaluation of the microsatellite sensor performance against a hyperspectral reference instrument. Based on that results, final adaptations could be made for the spaceborne sensors. The flights will be performed in Central Germany at agricultural sites and will be supplemented by in-situ reference measurements.

The concept and the status of preparation of the campaign will be presented.