

**The French-German Climate Mission MERLIN.** Gerhard Ehret, DLR Institute for Atmospheric Physics (Germany); Pierre Flamant, LMD/CNRS (France); Bruno Millet, CNES (France); Matthias Alpers, DLR Space Administration (Germany); Philippe Crebassol, CNES (France); and Christian Stephan, DLR Space Administration (Germany).

## **ABSTRACT**

MERLIN is a small satellite mission for the measurement of atmospheric methane ( $\text{CH}_4$ ) by the method of integrated-path differential-absorption (IPDA) lidar.  $\text{CH}_4$  is the second most important anthropogenic greenhouse gas after carbon dioxide ( $\text{CO}_2$ ) that will contribute to global warming, significantly. Large uncertainties exist for example in the estimation of  $\text{CH}_4$  emissions from tropical and boreal wetlands which are regarded as the largest natural sources of atmospheric methane. The lidar measurements from space will provide spatial and temporal gradients of the weighted column-integrated  $\text{CH}_4$  mixing ratio along the satellite sub-track that can be used to derive  $\text{CH}_4$  surface emission by means of inverse modeling. The instrument will be operated in low sun-synchronous polar orbit with a local time for the ascending node of about 06h00. It is planned to launch the MERLIN satellite in the time frame of 2016 with at least 3 years of operation in space. In our presentation we report on the mission status, the technical concept, and the expected measurement performance in view of the scientific requirements given by the MERLIN Scientific Advisory Group (SAG).