



A CubeSat Science Payload for Airglow Measurements in the Upper Atmosphere

Friedhelm Olschewski (1), Martin Kaufmann (2), Klaus Mantel (3), Tom Neubert (4), Heinz Rongen (4), Martin Riese (2), and Ralf Koppmann (1)

(1) University of Wuppertal, Institute for Atmospheric and Environmental Research, Atmospheric Physics Group, Wuppertal, Germany, (2) Research Centre Juelich, Institute of Energy and Climate Research Stratosphere (IEK-7), Juelich, Germany, (3) Max Planck Institute for the Science of Light, Erlangen, Germany, (4) Research Centre Juelich, Central Institute of Engineering, Electronic Systems (ZEA-2), Juelich, Germany

A CubeSat science payload for atmospheric research has been developed to study the dynamics in the upper atmosphere. The science payload consists of a small Spatial Heterodyne Interferometer (SHI) for the observation of airglow at 762 nm. The temperature distribution in the mesosphere and lower thermosphere (MLT) region can be determined from the line intensities of the oxygen A-band emissions. The temperature data will be used to analyze dynamical wave structures in the atmosphere. Integrated in a 6U CubeSat, the agility of a CubeSat shall be used to sweep the line-of-sight through specific regions of interest to derive a three-dimensional image of an atmospheric volume using tomographic reconstruction techniques.

Keywords: CubeSat payload, atmospheric research, remote sensing, O₂ A-band emission, Spatial Heterodyne Interferometer, dynamical structures, tomography in the atmosphere