

The MATS Satellite Mission – Tomography of Structures and Waves in the Upper Mesosphere and Lower Thermosphere

Jörg GUMBEL¹, OleMartin CHRISTENSEN¹, Linda MEGNER¹,
Donal P. MURTAGH², Nickolay IVCHENKO³, and the MATS Team

¹ *Department of Meteorology, Stockholm University, Stockholm, Sweden*

² *Earth and Space Sciences, Chalmers University of Technology, Göteborg, Sweden*

³ *School of Electrical Engineering, Royal Institute of Technology, Stockholm, Sweden*

MATS is a Swedish satellite mission in preparation for launch in 2019. It applies limb imaging, tomography and spectroscopy to study structures in the mesosphere and lower thermosphere. Primary measurement targets are O₂ Atmospheric band airglow in the near infrared (759-767 nm) and sunlight scattered from noctilucent clouds in the ultraviolet (270-300 nm). While tomography provides horizontally and vertically resolved data, spectroscopy allows analysis in terms of mesospheric composition, temperature and cloud properties. Based on a two year mission, the scientific analysis will address atmospheric wave structures and variability over a wide range of spatial scales. This presentation summarizes instrument and analysis ideas, and discusses scientific perspectives and relationships to other missions.

Key words: mesosphere, thermosphere, waves, airglow, noctilucent clouds