



The MATS satellite mission - tomographic perspectives on the mesosphere

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MATS (Mesospheric Airglow/Aerosol Tomography and Spectroscopy) is a Swedish satellite mission scheduled for launch in 2019. MATS science focuses on mesospheric wave activity and noctilucent clouds. Primary measurement targets are O₂ Atmospheric band dayglow and nightglow 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.

During 2015, the design of the MATS instrument was finalized, and the first complete instrument design will be shown in this presentation. As a part of this work, simulated measurements were performed and inverted using a 3 dimensional tomographic algorithm based on the optimal estimation method. As a result, the first quantitative estimation of the instruments capabilities and performance figures can now be presented, and hence give a more accurate picture of the scientific opportunities that the MATS mission provides.