

EGU23-11344, updated on 18 Apr 2024

<https://doi.org/10.5194/egusphere-egu23-11344>

EGU General Assembly 2023

© Author(s) 2024. This work is distributed under the Creative Commons Attribution 4.0 License.



Sensitivity of the cancellation factor spectral variations for temperature investigation in the mesospheric nightglow layer

Christophe Bellisario¹, Pierre Simoneau¹, Ewen Jaffré¹, Philippe Keckhut², and Alain Hauchecorne²

¹ONERA, Palaiseau, France (christophe.bellisario@onera.fr)

²LATMOS-IPSL, CNRS/INSU, UMR 8190, Univ. Versailles St-Quentin, Guyancourt, 78280, France

The infrared emission lines observed between 80 and 100 km known as nightglow allow the investigation of dynamic phenomena such as gravity waves acting on local temperature and density. Swenson and Gardner (1998) introduced the cancellation factor as the link between the nightglow intensity observed and the local temperature. In a previous study, we investigated local changes in spectral intensity using the main source of the nightglow OH. The variations showed dependencies on vibrational levels due to the differences in their reaction coefficients. We now extend the sensitivity study by performing 3D spatial tests. We briefly describe the nightglow evolution model (NEMO), which is developed on a pressure level grid where the gravity wave perturbation is applied. Inherent parameters of the perturbation such as spatial wavelengths are confronted to their impacts on the nightglow layer. In addition, spectral integration over infrared InGaAs camera is applied to allow comparisons with measurement campaigns.