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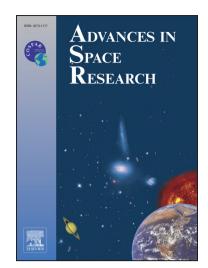
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Observation of a 27-day solar signature in noctilucent cloud altitude

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Abstract

Previous studies have identified solar 27-day signatures in several parameters in the Mesosphere/Lower thermosphere region, including temperature and Noctilucent cloud (NLC) occurrence frequency. In this study we report on a solar 27-day signature in NLC altitude with peak-to-peak variations of about 400 m. We use SCIAMACHY limb-scatter observations from 2002 to 2012 to detect NLCs. The superposed epoch analysis method is applied to extract solar 27-day signatures. A 27-day signature in NLC altitude can be identified in both hemispheres in the SCIAMACHY dataset, but the signature is more pronounced in the northern hemisphere. The solar signature in NLC altitude is found to be in phase with solar activity and temperature for latitudes $\gtrsim 70^{\circ}$ N. We provide a qualitative explanation for the positive correlation between solar activity and NLC altitude based on published model simulations.

Keywords:

Noctilucent clouds, polar summer mesopause, solar variability, remote sensing

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