
JOURNAL CLUB

Dynamical Analysis of Global Polar Mesospheric Cloud Measurements from the SNOE Spacecraft

by

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ABSTRACT

The Student Nitric Oxide Explorer (SNOE) has been observing polar mesospheric clouds (PMCs) since 1998 and has successfully measured seven PMC seasons. SNOE is a spinning satellite in a sun-synchronous near-polar orbit at 10:30 am/pm local time. In the summer seasons, the Ultraviolet Spectrometer (UVS) limb measurements include detections of PMCs between 80-88 km. SNOE observations of PMCs have a significant advantage over other PMC measurements in that it is able to observe them globally each day. Because SNOE orbits the earth 15 times a day, daily global images of PMC brightness may be produced. The daily images, shown in a movie format, reveal the day-to-day variability in latitude and longitude of the PMC occurrences. Case studies of 5-day periods show a westward movement of PMC formation with the suggestion of a 5-day Rossby wave. Further analysis shows that in fact, PMCs are modulated by a dominant 5-day wave, which is present in all measured north and south seasons. This is the first direct wave analysis performed on PMC measurements on a global scale and gives a strong indication of the dynamical effects on PMC formation.

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