THE SODIUM LAYER IN THE PRESENCE OF NOCTILUCENT CLOUDS - RESULTS FROM ODIN’S SUMMER MESOSPHERE MISSION

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It is known from in situ and lidar measurements that metal species can be depleted in the presence of noctilucent clouds (NLC). The OSIRIS optical spectrometer onboard the Odin satellite provides a unique opportunity to study the relationship between NLC and the mesospheric sodium layer on a "global" basis. Sodium is measured using the atomic Na D resonance lines near 590 nm; NLCs are observed over the entire spectral range of Osiris (275-815 nm). Results reported here focus on Odin's summer mesosphere mission during July 2002, a two-week period dedicated to phenomena connected to the cold summer mesosphere conditions. During this period, OSIRIS observed NLCs at latitudes above 55N, with a virtually complete NLC cover above 70N. A forward model for the Na D resonance radiative transfer has been developed as a basis for sodium retrievals. This allows us to obtain both sodium column densities and the vertical structure of individual profiles. The sodium results are compared to individual NLC measurements. Complementary to these observations, new laboratory studies investigate the uptake of sodium on cold ice surfaces.