

On the water vapour redistribution due to noctilucent clouds

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The redistribution of water vapour due noctilucent clouds has been a part in the discussions about this cloud phenomenon for a long time. First observations of enhanced water vapour layer were done with the MAHRSI instrument (Middle Atmosphere High Resolution Spectrograph Investigation) using OH as a proxy for water vapour and the HALOE instrument (Halogen Occultation Experiment) at the end of 1990ies. Since then a lot of model work has been done.

The instruments onboard the Odin satellite can now provide more detailed insights to the water vapour redistribution process. This includes the freeze drying effect inside the noctilucent cloud occurrence area, the enhancement of water vapour in a layer below the noctilucent cloud and as well at their lower latitude border. For our investigations we utilize the SMR (Submillimetre Radiometer) and the OSIRIS instrument (Optical Spectrograph and Infrared Imaging System). The OSIRIS instrument provides occurrence information of noctilucent clouds, while the SMR instrument provides information about the water vapour content. To obtain this we use the water vapour emission line at 557 GHz, which is the strongest water line in the millimetre and sub-millimetre frequency region and therefore provides water vapour informations up to 100 kilometre altitude, with a vertical resolution of 3 kilometre.

We present co-analysed results from both instruments. The latitude dependence of the relationship between water vapour and noctilucent clouds will be shown.