



Observations of ice cloud properties from Odin-SMR

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Ice clouds in the tropical upper troposphere are a main uncertainty in the prediction of future climate. Improved treatment of ice clouds in atmospheric modelling requires improved satellite observations. Odin-SMR (Sub-Millimeter Radiometer) is a limb sounder, dedicated to measure trace gases in the mesosphere and stratosphere. However, the lowest tangent point spectra of Odin-SMR extend into the upper troposphere, and Odin-SMR has sensitivity to high altitude ice clouds. For low tangent point spectra, ice clouds effectively reduce the brightness temperature as seen by Odin-SMR, and the induced brightness temperature depression is largely proportional to the amount of ice mass in the clouds. A simple first comparison of obtained results of yearly mean ice mass fields in the tropics from Odin-SMR and AURA-MLS, which is a similar limb sounder, has previously been performed. The results were in good agreement. Compared to climate models, the general geographical distribution of cloud ice mass agreed fairly well, but with discrepancies over Central Africa and South America, where both Odin-SMR and AURA-MLS indicate more ice mass in high altitude ice clouds than the models. Here the comparison is extended further, to include frequency of cloud occurrence, seasonal variations, and daily cycle variations. Also, new results from the recently released Cloudsat radar data, and more climate models, are considered.