



Subvisible cirrus clouds in the upper troposphere: A comparison of lidar observations with ECMWF operational analysis data.

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With the Mobile Aerosol Raman Lidar (MARL) of the Alfred Wegener Institute (AWI) we participated in a field campaign at mid latitudes (Lindenberg/Germany, 53°N, 15°E) from May to October 2003. During the frequent good weather periods of that unusual summer we observed a relatively high fraction (55 %) of coverage with thin cirrus. By means of a video camera we kept track of persistent contrails which occurred simultaneously with subvisible cirrus and which were often embedded inside the clouds. The cloudiness and the ice water content calculated by the ECMWF operational analysis agree in many cases remarkably well with the lidar observations. This is surprising since the ECMWF cloud formation scheme does not account for high supersaturation. As recently shown, such high supersaturations occur frequently in the upper troposphere. We will present an assessment of the most likely formation path for ice clouds in the upper troposphere based on backward trajectories, model data and our lidar observations.