



## **Dynamical case study for mesospheric water vapor over the Indian Ocean - links to the mesospheric jet**

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The Institute of Applied Physics of the University of Bern participated with its airborne water vapor radiometer AMSOS in the EU project SCOUT O3 in November 2005. The microwave radiometer flew on board a Swiss Airforce Learjet from Switzerland to Australia and back. Middle atmospheric water vapor profiles in the altitude range 15 to 75 km have been retrieved for the whole flightroute, which was the same for both flights separated by one week. Thus water vapor profiles can be compared for same regions but different days. Differences of about 20 to 30 % in the H<sub>2</sub>O volume mixing ratio were detected in the mesosphere over the Indian Ocean. The enhancement of water vapor over the Indian Ocean during the return flight one week after the outbound flight can be explained by middle atmospheric dynamics. Air trajectories were calculated by a self made trajectory model fed with ECMWF data. The water vapor measured on the outbound flight on November 8 2005 originated from the Caribbean. One week later, the wind direction changed from eastward to westward and the mesospheric air measured during the return flight originated from China, where Aura MLS measurements clearly show higher water vapor volume mixing ratios than one week before over the Caribbean. In this period of time, the region of northern India lay in the zone, where the mesospheric wind direction changed from eastward to westward. Another observation was that as soon as AMSOS flew 'out' of the mesospheric wind jet, having wind velocities up to 60 m/s in the subtropics, the water vapor volume mixing ratio abruptly changed to smaller values above 60 km altitude outside the jet.