

Water vapour soundings in the upper troposphere

Vaughan, G; Cambridge, CG; Dean, L; Hansford, GM; Eden, LE; Freshwater, RA; Turnbull, KfV; Hadaway, DE; Ostanin, VP; Jones, RL

We report on a study to compare upper tropospheric humidity measurements by three devices: Vaisala RS80 radiosondes, Meteolabor Snow White frost-point hygrometers and surface-acoustic wave hygrometers from the University of Cambridge, UK. The three devices were flown as an integrated package, together with an ozonesonde, on a series of 30 flights from Aberystwyth, UK. Evaluation of the Snow White sonde led to a modification to monitor the phototransistor output during flight. We report on the relative performance of the three sensors and conclude that the standard radiosonde measurements are accurate in the upper troposphere, provided certain corrections are made. Scatter plots of ozone and humidity in the upper troposphere show a marked seasonal variation.