Geophysical Research Abstracts
Vol. 14, EGU2012-8218, 2012
EGU General Assembly 2012

Cloud detection using disposable airborne sensors

K. Nicoll and R.G. Harrison
University of Reading, Meteorology, United Kingdom (k.a.nicoll@reading.ac.uk)

Measurements from airborne platforms are important for studies of clouds' impact on the radiation balance and on precipitation. A range of small, low cost, disposable sensors has been developed for cloud detection from unmanned balloon or UAS (Unmanned Aerial Systems) platforms (Nicoll and Harrison, 2010). The techniques already deployed include exploiting the associated solar radiation modification, electric charge changes, and optical fluctuations due to cloud droplets. As well as needing to be inexpensive, the sensors are required to be lightweight (mass typically $\sim$ 100g) with low consumption (typical power $\sim$100mW), and have been tested alongside standard meteorological radiosondes, as well as on a small UAS (SUMO – Small Unmanned Meteorological Observer (Reuder et al 2009)). Design criteria for these sensors will be discussed, as well as measurements from the test flights, through a variety of different cloud layers. The advantages of using optical and charge methods of cloud detection over the normal thermodynamic method deployed with conventional radiosondes (capacitative sensing of relative humidity combined with temperature measurements), will also be discussed.

Nicoll K.A. and R.G. Harrison. Research Radiosondes, Met. Tech. Int. Nov 2010, 140 (2010).

Reuder J., P. Brisset, M. Jonassen, M. Muller, S. Mayer. The Small Unmanned Meteorological Observer SUMO: A new tool for atmospheric boundary layer research Meteorologische Zeitschrift, Vol. 18, No. 2, 141-147 (2009).