



Atmospheric science sensors for small airborne platforms

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A suite of small, lightweight atmospheric science sensors has been developed for use on free balloons and UAS (Unmanned Aerial Systems) platforms. These include instruments to measure solar radiation, turbulence, atmospheric ionisation, aerosol particles, electrical charge and electric field. The small size and low cost of these sensors allow them to be flown alongside standard meteorological radiosondes, using a specially developed data acquisition system to transmit the extra sensor data over the radio link, obtained synchronously with the meteorological data. The sensors have been deployed in flights spanning a variety of different atmospheric phenomena, including clear air conditions, clouds, Saharan dust layers and volcanic ash plumes. Measurements obtained during these flights will be discussed, and the strategy for future sensor developments described. Although initially tested in the wide thermal and pressure conditions associated with a free balloon platform, the sensors are also suitable for use on small UAS. This will permit research into a wide range of properties of the lower atmosphere, particularly in circumstances dangerous to manned aircraft, such as inside volcanic ash plumes.