



Cloud measurements from radiosondes

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Radiosondes are under-exploited as measurement platforms for cloud research. Although the sensors conventionally carried by radiosondes allow the presence of clouds to be inferred thermodynamically, the vertical resolution in determining the horizontal cloud boundaries can be poor. This presentation discusses the development of additional sensors easily carried by radiosondes to determine cloud properties. By using active and passive optical principles, lightweight, inexpensive, low power, disposable detectors become possible. An active cloud droplet detector has been optimised to work in daylight conditions, using high brightness light emitting diodes to provide the optical source, with a semiconductor photodiode as the detector. The photodiode detector also provides a measurement of broadband solar radiation, hence, during daylight, an estimate of extinction within the cloud can also be derived. The sensor has worked reliably in both day and night time conditions. A selection of soundings made through layer clouds will be presented, which demonstrate the clear response to cloud layers, and, in some cases, the much improved resolution which can be obtained over thermodynamic cloud determination.