



Swarmsonde

In-situ mapping of evolving T, P, RH and wind fields in 3D

Swarmsonde is a novel measurement instrument that provides multiple measurement series in a defined volume of air for up to an hour. A swarm of balloon-borne sondes are launched in close proximity. The sondes ascend to a user-defined altitude, then follows the winds in roughly Lagrangian trajectories.

The sondes transmit all measured parameters over radio to the mobile ground station. Multiple ground stations can be used if the radio reception quality needs it. Or to support more sondes.

A real-time map continuously shows the location of all sondes. Individual sondes can cut down to fall to the ground, by remote command or after a set time.

Specifications	
Balloon size	8 gram, 20 liters of helium. 2 balloons needed per sonde.
Payload	12 grams
Sondes per radio frequency	16 (can be customized)
Radio transmission range	> 15 km from air-borne sonde
Sonde recovery	Transmitted GPS location. Buzzer. Strong LED. (Option)
Measurement period	~1 hour (can be customized)
Parameter	Measurement interval
Wind	2 sec
Position	6 sec
Geopotential altitude	12 sec
Temperature	2 sec
Humidity	2 sec
Pressure	6 sec
Battery voltage	On changes
Light level	(Option)
Acceleration / turbulence	(Option)



Reference

Paper: BAMS-D-17-0204 (under review)

Title: Above-ground thermodynamic observations in convective storms from balloon-borne probes acting as pseudo-Lagrangian drifters

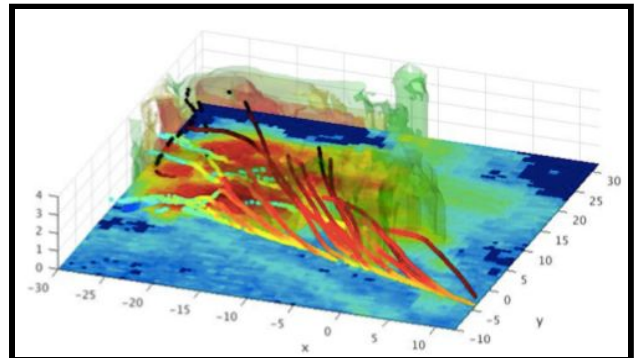
Authors: Paul Markowski, Yvette Richardson, Scott Richardson, and Anders Petersson

How does it work?

When the sonde is released from the ground it is attached to two balloons instead of one. At a user-defined altitude, one balloon is cut off from the sonde. The balloon that still is attached to the sonde has enough helium to keep the sonde at the preferred altitude for a longer time. The sondes use a TDMA radio algorithm to share a single frequency, and data compression to transmit all data over a long-range radio. Swarmsonde is based on the miniature radiosonde Windsond.



A Swarmsonde is released with two balloons attached to the sonde



Data from a measurement series from Penn State University, spring 2017

We welcome your inquiry for more information!