



Kite/balloon born sensor-unit lift system for very high resolved micro meteorological profile measurements under field campaign conditions

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Three (or four) sensor units, each equipped with at least temperature, pressure, relative humidity and wind sensors are transmitting data to a ground based receiver station. While one sensor unit is balloon/kite born another one is used as ground station on 2m height. The third sensor unit is a moving one driven by a double roller winch and covering the distance between the balloon/kite born and ground based units in an adjustable speed of 0.25 – 5 m/sec. If available, a fourth sensor unit is moving down, when the third one is moving up and vice versa. The double roller winch including a V25 control unit is running with a current of 24V provided by two car batteries. Beside the standard sensors, the units can be equipped with additional devices, like CO₂ -, ozone - sensors or particle counter. In each sensor-unit a micro-controller converts the sensor signals into a RS232 protocol which is transmitted over a radio modem to an appropriate receiver station. Distances up to 3000m can be covered. Incoming signals are online processed and stored on a laptop. A monitoring software provides appropriate images of the profile in a graphical user interface (GUI) to control the measurement experiment. Furthermore first data analyses, such as response time correction, can be realized by the control software. The system is developed to investigate micro meteorological phenomena like boundary conditions, but can also be used for now casting calculations. Due to the relative light equipment the system is extremely useful for field investigations with short term experiments or for regions with difficult logistical access.