

GCOS Reference Upper Air Network: Investigating the radiation error on radiosonde temperature measurements

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The measurement of atmospheric temperature by radiosonde instruments is affected by heating from sources other than the air itself. Solar and infrared radiation, heat conduction to the temperature sensor from its attachment points, and infrared radiation emitted by the sensor are heat sources or sinks that make temperature of the sensor different from that of the air in which it is embedded. Here we show experiments using special ballooning techniques that allow flying temperature sensors in shaded and unshaded conditions to investigate direct solar radiation effects on sensors. Radiation instruments are flown simultaneous to determine the radiative flux at different altitudes and in different cloud conditions. Results from first flights and the relation between measured radiative fluxes and the radiation effect on temperature sensors are presented.