The sensors used in this process are digital Dallas DS18B20 temperature sensors. Each sensor is manufactured with a unique 64-bit serial code address allowing for multiple sensors to be arranged in a 1-wire multi-bus configuration. The GT probes used are NIST certified thermocouples. The Dallas sensors are calibrated against the GT probes, which serve as the gold standard for all calibration work. An Arduino Mega is used in conjunction with the Dallas sensors. The code utilizes a record on an SD card which includes a timestamp along with the temperature of the particular sensor queried.

**Two-Point Calibration**

Once the four data points were collected for each sensor, the near equilibrium temperature conditions were averaged and used as data points for calibration curves. For each individual sensor, a calibration curve was made using GT probe data as the input, and Dallas sensors temperatures as the output. A calibration equation was then extrapolated from the curve and used as the correction factor for all temperature collected by that unique sensor.

The Dallas sensors were flown on a 10ft wake boom with 22 sensors total on a single 1-D wake arm. Prior to a flight, the sensors were painted with a light coat of whiteout and the wires that run the length of the wake arms were wrapped using white tape. The white color helps reduce heating due to absorption of thermal energy. The Dallas sensors were used in conjunction with Onset corporation thermistor sensors.

**References**


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