

RELAMPAGO

Colorado State University surface weather dataset

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1.0 Data Set Overview

During RELAMPAGO, Colorado State University (CSU) collected surface meteorological data on a 2-m tower during mobile deployments for Intensive Observing Periods (IOPs) in a variety of locations across Argentina. Observations of air temperature, humidity, wind (speed, direction, and gusts), and pressure were collected at 1-minute intervals during RELAMPAGO IOPs 1-17, with the exception of IOP8. This covers the period from 2 November to 14 December 2018.

2.0 Instrument Description

A MetOne AIO2 Sonic Weather Sensor was transported in a van during mobile data collection in RELAMPAGO IOPs, and installed on a 2-m tripod during these deployments. This instrument measures air temperature, relative humidity, wind speed, direction, and gusts, and atmospheric pressure. Data were recorded using the MetOne Automet 580 logger at 1-minute intervals.

The data sheet for the AIO2 is available at: <https://metone.com/wp-content/uploads/2019/10/AIO2-1.pdf>

3.0 Data Collection and Processing

During RELAMPAGO, the surface station was generally deployed and collecting data during all IOPs when the CSU sounding team was also launching radiosondes. The primary purpose of the surface measurements was to obtain representative surface conditions at the time of launch, but the data may also be useful for other research on cases observed during RELAMPAGO.

The surface station was, when possible, deployed in an open space as far away from the van as the extension cord would allow (the station needs to be connected to a power source). A photo showing an example deployment is given below.



Figure 1: Photo showing typical setup of all-in-one surface station (foreground) with respect to vehicle during a CSU deployment.

In most cases, the surface station was deployed as soon as the CSU sounding team arrived at their assigned launch location for a given IOP, and data were collected until the end of the mission. However, in some cases, the group was actively targeting a particular feature (typically updrafts) for sonde launches, and the surface station was only briefly installed to collect information about the surface conditions at that location. These data were typically only available for a few minutes, and the low confidence in the quality of the data in these situations caused us to remove them from the surface dataset.

Additional manual QC was performed on the surface data, primarily to remove the first several minutes of data after deployment, which showed clear evidence of the instruments adjusting to the ambient conditions after being removed from their storage cases. A few additional measurements were removed when data appeared to be clearly erroneous.

4.0 Data Format

A comma separated values (CSV) file is included for each IOP in which data were collected. The columns in each file are labeled, which includes the time (UTC), wind speed (m/s), wind

direction (degrees), air temperature (degrees C), relative humidity (%), barometric pressure (mb), solar radiation (W/m^2), compass direction of instrument (degrees), wind gust (m/s), standard deviation of the wind direction (degrees), latitude, and longitude of the station.

5.0 Data Remarks

As noted above, data was removed in instances when the sensors were adjusting to the ambient conditions, and in a few occasions of clearly erroneous data.

Solar radiation measurements are provided by the station, but we made no attempt to calibrate those measurements, so they should be treated with great caution. The other sensors on the all-in-one station were calibrated by MetOne in April of 2016.

6.0 References