PRECIP 2022 Radiosonde Dataset v1.0

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1.0 Data Set Overview

During PRECIP 2022, two Vaisala upper-air radiosonde systems were operated to provide balloon-borne Vaisala RS41-SGP radiosondes from research sites located in Hsinchu, Taiwan and Yonaguni, Japan. An automated sounding system operated by the Taiwan Central Weather Administration and managed by U.S. and Taiwanese students was also utilized in Hsinchu for RS41-SGP radiosonde launches. Radiosondes were generally launched four times daily at 00, 06, 12, and 18 UTC, with some additional launches during intensive observing periods. In total 651 soundings were collected and are contained in this dataset, covering the period from 25 May to 12 August 2022.

2.0 Instrument Description

The Vaisala MW41 radiosonde system was configured and installed at the Japanese Meteorological Administration weather station in Yonaguni, Japan. The antenna was placed on the roof of the building and all soundings were launched from an asphalt area next to the building. Vaisala RS41-SGP radiosondes were used, and attached to 100-g meteorological balloons from Scientific Sales, which were inflated with hydrogen. Data were collected and processed by a Vaisala Sounding Processing System and software version MW41 2.2.1.

In Hsinchu, Taiwan, the soundings were primarily launched from an automated system that had the same Vaisala software as the system in Japan. All balloons were 100-g meteorological balloons inflated with hydrogen. A few launches were made manually with the CSU Vaisala system using helium when the automated system was under repair.

Vaisala RS41-SGP data sheet: https://docs.vaisala.com/v/u/B211444EN-H/en-US

3.0 Data Collection and Processing

Soundings were collected from fixed locations in Yonaguni, Japan and Hsinchu, Taiwan. Soundings were launched four times daily during the project period with a few extra

soundings for periods of meteorological interest. The primary data quality control and assurance was automatically performed by the Vaisala Digicora software. This includes corrections for the standard known biases of the instrument. Additional quality control was performed by processing with the NCAR software called ASPEN which checks for errors that are not identified by the Digicora software. Furthermore, each skew-t log-p diagram was manually inspected independently by at least two individuals to identify any significant errors. Notes taken by the sounding reviewers are included as an attachment to this document. Data are included for all portions of the soundings that were collected, as long as the data do not appear to be erroneous. Since the soundings were launched from operational weather stations, data from the local operational surface station was used to obtain representative surface conditions (temperature, humidity, winds, and pressure) at the time of launch.

4.0 Data Format

The provided data is designated as “Level 2”, which is quality controlled measurements without additional scientific analysis or added products. For each sounding, three files are provided. The “csv” format is a comma separated value ASCII format containing the data processed by both the Digicora and ASPEN processing. Column headings and units and other metadata including the launch location, ascent rate, termination altitude, etc., as well as the surface conditions from the Automet surface station, are also included in the files. The “eol” format is a similar ASCII format that is commonly used for radiosondes and dropsondes processed by ASPEN. The data is identical to that found in the “csv” files, but presented in a slightly different format for convenience with other analysis software. The "png" files are portable network graphics files showing Skew-T log-p diagrams of the soundings.