

# The Development of NTU Mini Radiosonde and Its Possible Applications in Atmospheric Sciences

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## ABSTRACT

In this study, we introduce a newly-developed upper-air observational instrument for atmospheric research. The “Storm Tracker” (or “NTU mini-Radiosonde”), is an ultra-lightweight (about 20g including battery), multi-channel simultaneous capable radiosonde designed by the Department of Atmospheric Sciences at National Taiwan University. Developed since 2016, the Storm Tracker aims to provide an alternative for observation of atmospheric vertical profiles with a high temporal resolution, especially lower-level atmosphere under severe weather such as extreme thunderstorms and tropical cyclones. Field experiments were conducted as trial runs at land of Taiwan and TAHOPE, to examine the ability of the Storm Tracker on boundary layer observation, in addition to the inter-comparison between the Storm Tracker and the widely used Vaisala RS41-SGP radiosonde. Among the co-launches (~1200 pairs) of the Storm Tracker and Vaisala RS41 radiosondes, the measurements of pressure, wind speed, and wind direction are highly consistent between the Storm Tracker and Vaisala RS41-SGP. However, a significant daytime warm bias was found due to solar heating on sensor chip. We process three methodologies to do data bias correction to reduce warm biases. With the much lower costs of the radiosondes and the simultaneous multi-channel receiver, the Storm Tracker system has shown great potential for high-frequency observational needs in atmospheric research. In Order to conduct the highly time resolution, an autolaunch machine is also tested in this spring of 2022.

## REFERENCES

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