

# **Disaster Scenario Related to the Observations of Dual Polarization Radar on the September 10 Chiayi Flood in 2023**

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## **Abstract**

The short-duration and intense rainfall event on 10 September 2023 due to the influence of tropical depression nearby the southwestern coast of Taiwan brought a flash flood with related landslides and damage to the houses and crops in the areas of Chiayi City and Chiayi County. The objective of this research is to realize the multi-scale conditions on the September 10 Chiayi flash flood event, and furthermore, dig out the physical mechanisms based upon the observations of dual polarization radar at Chiayi for disaster prevention and early warning. Basically, the radar transmits and receives pulses in both a horizontal and vertical orientation. As a result, the returning frequencies provide measurements of the horizontal and vertical dimensions of targets, supplying forecasters with better estimates of the size, shape, and variety of hydrometeor particles.

Preliminary outcomes based upon the characteristics of TD and hydrometeor particle analysis illustrate that the radar has intensive monitoring effects on the development of severe convective cells, showing that the specific differential propagation phase shift (KDP in deg/km) values in RHI (Range Height Indicator) radar display at azimuthal angle of 136° are of 2.4 and 8.0, a high moisture, relating to the rainfall rate of 55.5 mm/h between 18~19LST in the Zhongpu area, a main precursor to intensive rainfall occurrences. And more discussions on different radar parameters are well prepared.

Key words : tropical depression, flash flood, dual polarization radar