

Feasibility Assessment of Heavy Rainfall Forecast Using GPS-Derived ZTDs

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This study focuses on the correlation between Zenith Total Delays (ZTDs) derived from global positioning system (GPS), and rainfalls. The feasibility assessment of heavy rain forecast by GPS-derived ZTDs during typhoon events are subsequently analyzed. The study period are selected during the strong typhoon events in recent years. We use the method of Point Precise Positioning (PPP) with the software “Bernese 5.2” to compute ZTDs in 129 GPS stations during study period. The ZTD results are both compared with those from University of the Atmospheric Research (UCAR), and the rainfall data from the rainfall stations of Central Weather Bureau, Taiwan. We currently have preliminarily analyzed the correlation between ZTDs and the rainfalls at 18 GPS-rainfall stations (See the attached Figure) during the period of Typhoon Soudelor, 2015. We conclude that heavy rain forecast by GPS-derived ZTD has great potential and it is worth doing further research for typhoon disaster prevention.

Keywords: GPS, ZTD, heavy rain forecast, typhoon disaster prevention

