

Rainfall estimation for Central Vietnam by using the DongHa radar reflectivity

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In the past recent years, the Vietnam Meteorological Hydrological Administration (VMHA) has made significant investments in weather radars. The existing VMHA radar network includes 9 operational radars, comprised of C-Band and S-Band radars. The initial plan according to Decision 16/2007/QD-TTg of the Prime Minister of Vietnam was to install in total 15 weather radars over the whole Vietnam in the near future. Our study firstly analyses the beam blocking issues with the existing and future radar networks of Vietnam based on the Digital Elevation Model (DEM) data. Results showed that the mountainous ranges in the western part of Vietnam blocked the radar beams below a certain elevation. e.g. 3000 m. The radar network does not have the blocking issues in the eastern side of the country, allowing a good monitoring of the convective systems coming from the East Sea.

In the second part of the presentation, we present a case study that applies radar reflectivity data for rainfall estimation in Central Vietnam. The study area is from the QuangBinh province to Hue. The rainfall season over the area is mainly from August to November, accounting for about 60 - 70% of the total annual rainfall. Intensive rainfall events that are concentrated in a short period and over a steep topography usually cause flooding events and severe damages in the region. Thus accurate and timely information about rainfall is of great importance and practical significance. Consequently, we collect the radar reflectivity from the DongHa radar and the rainfall data from 30 automatic rain-gauge stations in the last 10 years (2010-2019) to build the Marshall-Palmer statistical relationships for the different rainfall types in the region, including: tropical cyclones, cold surges, intertropical convergence zone, and others. The results will then be evaluated with independent rain-gauge stations and also be compared with the derived rainfall from the Global Satellite Mapping of Precipitation (GSMaP) project.