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Precipitation estimation using Himawari-8 in Vietnam

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Vietnam is an area of complex weather characteristics, which is clearly affected by climate changes. The increased occurrence frequency of strong storms and heavy rains for many days in the large extent caused floods, flash floods, landslides continuously, and severe consequences of properties and people's lives. Precipitation estimation for the nationwide range in realtime has an important significance in offering rain and flood predictions in order to support economic and social developments and people's safety. Using Himawari-8 satellite data combined with ground measurement station data to build the precipitation map for the nationwide range in near real-time has become a new research direction, which helps to provide additional information for the areas of lack of rain gauge and weather radar data. This work used Random Forest machine learning model to estimate precipitation in Vietnam with moderate temporal and spatial resolutions (about 0.04 degree and every 60 minutes). Training and testing data are brightness temperatures collected by radiometers installed in the Himawari-8 satellite and precipitation measured at rain gauges (about 1500 stations) located in Vietnam during heavy rains in 2019 and 2020. This work could be extended to precipitation estimation using other geostationary satellite data such as GeoKomSat and FengYun and so on, improve precipitation estimation in Vietnam in terms of accuracy and area.