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M.S. Defense Announcement

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SCHOOL OF OCEAN AND EARTH SCIENCE AND TECHNOLOGY

A Diagnostic Study Of Rainfall Evolution In A Week Landfalling Tropical Cyclone Over East China

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You are invited to a Zoom meeting.
When: April 15, 2021 at 3:00PM HST

Register in advance for this meeting:
https://hawaii.zoom.us/meeting/register/tJwodOugrj4vHtcOKb2izPGol7cqieM39_cs

After registering, you will receive a confirmation email containing information about joining the meeting.

Abstract:

Tropical storm Rumbia (2018) made landfall over East China on 16 August 2018 with a moderate intensity but led to long-lasting and heavy landfall, causing causality and tremendous economic loss to East China. In this study, the fifth generation European Centre for Medium Range Weather Forecasting (ECMWF) reanalysis (ERA-5) data, the best-track tropical cyclone data, and rainfall observations from China Meteorological Administration (CMA) were used to diagnose the rainfall evolution of Rumbia after its landfall. Results showed that when it approached and made landfall over East China, Rumbia was embedded in an environment with a deep-layer (300–850hPa) southwesterly vertical wind shear (VWS), heavy rainfall mostly occurring downshear-left in its inner-core region and downshear-right in the outer-core region. The translation of Rumbia also contributed to the rainfall distribution to some extent. The strong southwesterly-southeasterly summer monsoon flow transported water vapor from the tropical ocean and the East China Sea to the storm's core region, providing moisture and convective instability conditions in the mid-lower troposphere for the sustained rainfall even after Rumbia moved well inland. The low-level convective instability and the deep-layer environmental VWS played an important role in deepening the inflow boundary layer and the development of the secondary circulation and the heavy rainfall in the northeast quadrant of Rumbia. It is concluded that the environmental VWS and the storm translation are key to the asymmetric rainfall distribution, and the southwesterly-southeasterly summer monsoon flow transported warm and moist air from the tropical oceans and provided the moisture and convective instability conditions to the sustained rainfall of Rumbia after its landfall.