平成30年7月豪雨における水蒸気輸送および海面蒸発偏差の解析
Anomalous Moisture Transport and Oceanic Evaporation during a Torrential Rainfall Event over Western Japan in Early July 2018

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Western Japan experienced torrential rainfall in early July 2018, which caused severe floods and landslides especially over western Japan. Japan Meteorological Agency (JMA) reported that this extreme event was associated with extreme enhancement of northward moisture flux and its convergence over western Japan. Some recent studies have pointed out an essential role of surrounding oceans for extreme rainfall events through the anomalous heat and moisture supply to the warm, moist monsoonal airflow. This study investigates anomalous oceanic evaporation during the torrential rainfall event over western Japan based on the objective analysis data from the JMA Meso-Scale Model. We have found that the heavy rainfall was associated with enhanced oceanic evaporation extensively around Japan, especially along the Kuroshio and entirely over the Japan Sea. We then conducted a linear decomposition of local surface latent heat flux anomalies based on the bulk formula to determine factors for the enhanced evaporation. Our results show that the enhanced evaporation under the pronounced southerly inflow toward the extreme rainfall region was mainly due to increase in the surface wind speed along the Kuroshio south of Japan, with an additional contribution from warm SST anomalies to the enhanced moisture inflow into central Japan. In order to quantitatively assess contribution of the enhanced evaporation to anomalous moisture transport in the mixed layer, we also performed a backward trajectory analysis for moist air parcels. It reveals that anomalous moisture supply from the ocean to air parcels along trajectories is dominated by enhanced evaporation due to the stronger surface wind speed, which corresponds to about 20 % of the column water vapor anomaly and about 5 % of the total column water vapor.

