Radar analysis of linear rain bands occurred Kochi Prefecture during the Heavy Rain Event of July 2018

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The torrential rain from 28 June to 8 July in the west Japan killed more than 200 peoples and called as “the Heavy Rain Event of July 2018” by Japan Meteorological Agency (JMA). Cumulative rainfall in Kochi Prefecture was maximum in all over the west Japan. Several quasi-linear rain bands appeared here in the latter half of the heavy rain event of July 2018. The present study aims to clarify the structure of these rain bands.

We employed JMA Muroto radar data and our compact X-band radar network data and evaluated reflectivity and Doppler velocity around rain bands. We also made dual-Doppler analyses.

Many rain bands appeared from 9JST on 4 July to 0JST on 9 July. They occurred in the environment of stationary front. At the first time, rain band appeared in the east portion of Kochi Prefecture, and then the location of rain bands was gradually moved westward. Four principal rain bands were observed from 21JST on 5 July to 3JST on 7 July. They continued for 8 to 12 hours. Their main axis was southwest to northeast. Accumulated precipitation amounts due to these rain bands were 200 mm to 500 mm. These values were 30 to 40 percent of total rainfall.

Another principal rain band appeared the west end of Kochi Prefecture from 3JST 8 July. It yields heavy rain of 263 mm in for three hours in Sukumo city and JMA issued the heavy rain emergency warning for the first time in Kochi Prefecture. The main axis of this rain band was for south to north and it had the width wider than the other rain bands. The convergence line was clearly observed parallel to the main axis of this rain band, but it inclined westward in the lower layer. We will also show the results of dual-Doppler analysis. The result of it will clear the structure of wind field around linear rain bands.

Keywords: Heavy rain, Rainband, Dual-Doppler analyses