



Climatological precipitation characteristics and large-scale atmospheric fields on the heavy rainfall days in the eastern part of Japan in midsummer

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In the warm season in East Asia, rather larger amount of precipitation is brought of the midlatitude region in the world by the great contribution of “heavy rainfall days”(e.g., with the daily precipitation more than 50 mm). Especially, this is remarkably found in the mature stage of the Meiyu/Baiu season in the region from Central China to the western part of the Japan Islands. However, although the total precipitation and the contribution of the “heavy rainfall days” to it in the eastern part of the Japan Islands during that season are not so large than in the western Japan, the total precipitation from the Baiu season to midsummer there is still considerable compared to that in the other midlatitude regions in the world such as Europe. As such, our group (Matsumoto et al.;EGU2014-4772-1)has already reported the rainfall characteristics and large-scale atmospheric fields on the “heavy rainfall days” in the mature stage of the Baiu season (16 June ~ 15 July) at Tokyo in the eastern part of the Japan Islands, based on the daily and the hourly precipitation data from 1971 to 2010. They revealed that, the half of the "heavy rain days" at Tokyo were related directly to the typhoons even in the Baiu season. In addition, in the half of the "heavy rain days" there the total daily rainfall was contributed to mainly by the “moderate rainfall” with the hourly precipitation less than 10 mm.

Succeeding to the above report, this study firstly examined the rainfall features and the atmospheric fields for the other patterns of the “heavy rain days” at Tokyo, although the appearance frequency was low (3cases). In these cases, although the synoptic situations were rather different among each other, the they seem to occur under the situation of relatively small zonal scale systems associated with the great meander of upper-level westerly(the cold vortex was also found to the northern area in the two cases).

Next, the similar climatological analyses to Matsumoto et al.(EGU2014) were performed for the rainfall characteristic and the related atmospheric fields for the "heavy rain days" at Tokyo in the eastern Japan during the midsummer (1~31 August). As for the midsummer, the total precipitation on the “heavy rainfall days” at Tokyo was contributed to by the intense rainfall with more than 10 mm/h, as the daily heavy rainfall in the western Japan in the Baiu season does. In addition, detailed examination of the rainfall features was also made for some cases with use of the 10-minute precipitation data at the stations of the JMA and the Radar AMeDAS composite date by the JMA, organized meso-scale convective rainfall systems just to the east of the typhoon in that case in midsummer showed rather similar features as often appear in the western Japan in the mature stage of the Baiu season.