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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Geostatistical assessment of summertime rainfall observations in Korea based on composite precipitation and satellite water vapor data" *by* Sojung Park et al.

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Reply to the Comments by Referee 1 for Manuscript hess-2018-83

General comments: *This manuscript assess the summertime rainfall characters in Korea via the geostatistical analyses on the composite precipitation and satellite water vapor data. Results show that the e-folding distance of precipitation ranges between 15 and 35 km while the e-folding time ranges between 1 and 2 h. The spatial autocorrelation has characteristic directionality. The results show that the current observational network with spation resolution of 13 km is difficult to capture the*

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characteristic features of the localized heavy rainfall systems. It is also noted that the orographic effect is not assessed in this manuscript.
The manuscript is well organized and I suggest accept with minor revision.

$\Longrightarrow$ We appreciate the positive comments by the referee. We have improved the manuscript by clearly describing some unclear sentences and figure captions. In the following, we made an item-by-item response to the specific comments by the referee.

Specific comments:

1) *Page 2, line 11-14, this sentence is too long.*

   $\Longrightarrow$ We have rewritten this part as:

   > Capturing the spatiotemporal features of precipitation systems out of the observation networks is essential to the successful runoff forecast, especially at the catchment scale and for the flooding cases (Volkmann et al., 2010).

2) *Page 12, line 9: "Korea" should not be subject.*

   $\Longrightarrow$ We have changed this part to:

   > Currently, the precipitation observation network in Korea has a spatial resolution of $\sim$13 km, distributing the analysis in an interval of 1 h.

3) *Page 27, in Figure 9 caption, a simple description of the case will be better, same for Fig 10–11.*

   $\Longrightarrow$ We have given a description of the case by including the precipitation type in each figure; however, we kept the information on time and date for each

event because it is usually requested by the readers for the case studies. We have rewritten the figure's by reflecting other referee's comments as well. The modified captions, with new statements in bold, are as the followings:

> Figure 9. **An LPMP case at 05 KST 25 August 2015:** (a) Precipitation distribution (source from https://afso.kma.go.kr/), (b) local Z(G_i), (c) local Moran's I (I_i), and (d) Z-score of I_i. **The computational domain covers the area of** $34.34 - 38.97°$ **N and** $124.25 - 130.05°$ **E. Precipitation systems with maximum intensity and strong cluster characteristics** are marked by the crosses, and the cold spots with dispersion pattern are denoted by the arrow. **Non-precipitating areas have no color shading.**

> Figure 10. Same as in Fig. 9 but **for an HPMP case at 17 KST 27 May 2013 and the computational domain of** $33.43 - 38.05°$**N and** $124.25 - 130.04°$**E**.

> Figure 11. Same as in Fig. 9 but **for an HPFP case at 05 KST 24 October 2015 and the computational domain of** $37.14 - 39.06°$**N and** $123.32 - 131.21°$**E**.

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