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Interactive comment on "Spatiotemporal patterns of synchronous heavy rainfall events in East Asia during the Baiu season" *by* Frederik Wolf et al.

Anonymous Referee #2

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The manuscript proposes an investigation on heavy rainfall occurrences in East Asia during the Baiu season with a focus on their spatiotemporal patterns as evidenced by event coincidence analysis and functional climate networks. The topic is interesting and the study presents elements of novelty and originality both in the methodology and the analysis of the results. The Manuscript is well written and well balanced in each part. Therefore, given the good quality of the paper I would be oriented to suggest accepting the paper as it is for publication on ESD. However, I have some observations that authors and editors may take into account if they agree and think are useful to improve the manuscript. 1) In my experience, TRMM data are biased, resulting in general an underestimation of the effective heavy rainfall amount. The choice to assume 90th percentile as threshold for identifying heavy rainfall, instead of higher ones, and

the fact the authors work on rainfall occurrence of rain amount exceeding that threshold should not have significant effects on the proposed analysis, but a brief discussion about the reliability of TRMM data in the context of the study probably could be appropriate. 2) The paragraph 2.2 Event Coincidence Analysis (ECA) and 2.3 Functional Network analysis should be revisited because they are not sufficiently clear specially for people not familiar with the methodology proposed. For example, the variable s_j in Eq.(1) is not defined. Furthermore it is not clear to me why for $\tau=0$, Q_{ij} of Eq.(5) and Eq. (6)should be different. I am not so sure that ECA is in each case better than ESS. There are proposals that solve the drawbacks in Quiroga et al. 2002, see for example Conticello et al,2018, InternationalJournal of Climatology, 38(3), 1421-1437., or Conticello et al. 2020, WaterResources Research 56.4 (2020): e2019WR025598 3) If and eventually how the morphology of Japan, characterized by steep mountains 1500 to 3000 m. high, affects heavy rainfall spatiotemporal structure of the region examined, probably deserves some mention.