

Interactive comment on “Weakening anomalies of East Asian Summer Precipitation Influenced by the Tibetan Plateau Warming Amplification” by Mei Liang et al.

Anonymous Referee #2

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Major comments: Both the warming amplification over the Tibetan Plateau (TP) and the decadal change in eastern China feature by the so-called southern flood-norther drought have been well documented. In this work, the authors argue that the relationship between the TP temperature and summer precipitation in East Asia seems to be weakened after the enhanced warming amplitude over the TP. The data employed in this work, including station observed temperature and precipitation, GPCP precipitation field, together with MERRA2, are basically reliable. However, the method (liner regression) and overall procedure are questionable. Statistical relationship between the TP warming and summer precipitation in East Asia dese not necessary mean intrinsic connection between them. The explanation for the influence of TP warming upon

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the summer rainfall change presented here cannot provide solid evidence. In fact, at least the following issues need be answered before one can accept the main conclusion drawn here. First, warming in which season is responsible for the circulation and rainfall pattern change in downstream regions? Second, during 1979-2016, for which period this connection is obvious? Third, if this connection is real, it appears in decadal time-scale or just linear trend? Fourth, what is the involved mechanism? In this work the authors claimed that the two Rossby wave trains related to the TP warming are responsible for the rainfall change in north part of East Asia and south part of East Asia, respectively. However, atmospheric wave pattern is stimulated by topography or diabatic heating, sometimes also generated from internal dynamics in atmosphere. Since the topography remains unchanged, TP warming induced heating anomaly or internal dynamics induces these two anomalous wave trains? Finally, global warming and/or interdecadal natural variability such as AO, PDO, and AMO are often used to explain the summer rainfall change in this area. How to exclude these factors and identified the regional contribution of the TP warming?

Specific comments:

1. The results shown in Fig.1 and 2 are annual mean or winter season? 2. Figure 4b. The two rectangular represent north and south parts of East Asia, respectively. However, salient regional difference in summer precipitation can be easily seen in these two domains. This basic feature has also been reported by many literatures. Therefore, it is not reasonable to divide the entire East Asia into only two regions. 3. Figure 5. What season for temperature in eastern TP? And it is also strange that the summer precipitation during 1979-2016 regressed on the temperature in eastern TP is almost same with that with liner trend removed. Did the author removes the trend in TP temperature and precipitation simultaneously? 4. Two Rossby wave trains shown in Fig.8a and b are used to explain the possible mechanism of TP warming effect. At least in the lower panel. i.e., the south branch in the lower troposphere, the wave pattern is hard to identify especially for the anticyclone just to the south of TP.

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