We thank the reviewer for his careful reviews, constructive comments and suggestions, which are important for us to improve this manuscript. We will revise the manuscript according to the reviewer's comments. The following is the point-to-point response to the reviewer's comments.

Summary:

Based on reanalysis and simulations of the last millennium, the existence of the linkage between decadal changes in precipitation in arid central Asia and humid Asian monsoon regions was ascertained in this paper. The decadal linkage is characterized by the same changes in precipitation in arid central Asia and southern China, which were the opposite of those in the South Asian monsoon region and most of northern China. This paper also found that the internal variability associated with the Interdecadal Pacific Oscillation (IPO) plays a dominant role in connecting the decadal variations in precipitation between arid central Asia and monsoonal Asia by modulating the precipitation of their respective major rainy seasons. Besides, this decadal linkage of precipitation variation causes a similar decadal linkage between moisture changes in central Asia and monsoonal Asia.

Recommendation:

I think this paper is well written, well organized, and well diagramed. And this paper tried to ascertain and explain the observed decadal linkage between

precipitation changes in Asian arid regions and monsoonal regions during the current period based on longer data (i.e., reanalysis and simulations of the last millennium), which is meaningful and interesting. However, I still have some comments. I think it is publishable after some comments in the following are considered.

Response: Thanks very much for your support and suggestions!

Main comments:

(I) The "time period 850–2005" in captions of several figures (e.g., Fig. 7 and 9) is inaccurate, because the simulations forced by ozone and aerosols only cover the time period 1850–2005.

Response: Firstly, we apologize for the inaccurate statement. For the caption of Fig. 7, the brief title sentence for the whole figure (i.e., "The leading decadal precipitation mode for the time period 850–2005 in the control and single-forcing simulations.") will be replaced by "The leading decadal precipitation mode for the time period 850–2005 in the control and single-forcing simulations, with the exception of leading mode for the time period 1850–2005 in experiment forced by ozone and aerosols." in the revised manuscript.

For the caption of Fig. 9, the brief title sentence (i.e., "The simulated leading decadal aridity index mode for the time period 850–2005.") will be replaced by "The simulated leading decadal aridity index mode for the time period 850–2005 in all the

experiments, with the exception of leading mode for the time period 1850–2005 in experiment forced by ozone and aerosols.”.

Similar inaccurate statement also existed in the caption of Fig. S10. The brief title sentence for the whole figure (i.e., “The simulated leading decadal soil moisture mode for the time period 850–2005.”) will be replaced by “The simulated leading decadal soil moisture mode for the time period 850–2005 in all the experiments, with the exception of leading mode for the time period 1850–2005 in experiment forced by ozone and aerosols.”. Thanks very much for your comment!

(II) Section 3.3 Processes of the IPO modulating the leading precipitation pattern is relatively long. It seems that this section is organized by the “Processes of the IPO modulating precipitation of major rainy seasons in central Asia” and “Processes of the IPO modulating precipitation of major rainy seasons in monsoonal Asia”. It would be easier to follow if the authors subdivide this section into two further subsections by adding subsection titles.

Response: The section 3.3 will be divided into two parts (i.e., “3.3.1 Arid central Asia” and “3.3.2 Asian monsoon regions”) in the revised manuscript. Thanks very much for your comment and suggestion!

(III) It is interesting that the IPO plays a dominant role in connecting the decadal variations both in precipitation and in moisture between arid central Asia and monsoonal Asia. Besides, the variations in moisture conditions result

from the combined effect of precipitation and PET, as indicated by the aridity index (AI). Then I wonder how IPO affects the PET and whether the impact of IPO on PET positively contributes to the decadal linkage of moisture changes in central Asia and monsoonal Asia or not.

Response: Figure R1 shows the PET anomalies during the positive phases of the IPO in all the experiments. The PET anomalies associated with the positive IPO in all the experiments showed negative anomalies in arid central Asia and southern China and positive anomalies in the South Asian monsoon region and most of northern China. These PET anomalies contribute to wetter conditions in arid central Asia and southern China and drier conditions in the South Asian monsoon region and most of northern China, which is consistent with the contributions of precipitation anomalies associated with the positive IPO. Thus, the impact of IPO on PET also positively contributes to the decadal linkage of moisture changes in central Asia and monsoonal Asia. However, the variations in PET can be determined by many factors (i.e., near-surface temperature, available energy, relative humidity, wind speed) according to the Eq. (2). This suggests that the impact of IPO on PET, especially the processes of IPO modulating the PET changes needs more in-depth analyses. We will try to do these analyses in detail in another study. Thanks very much for your comment and suggestion!

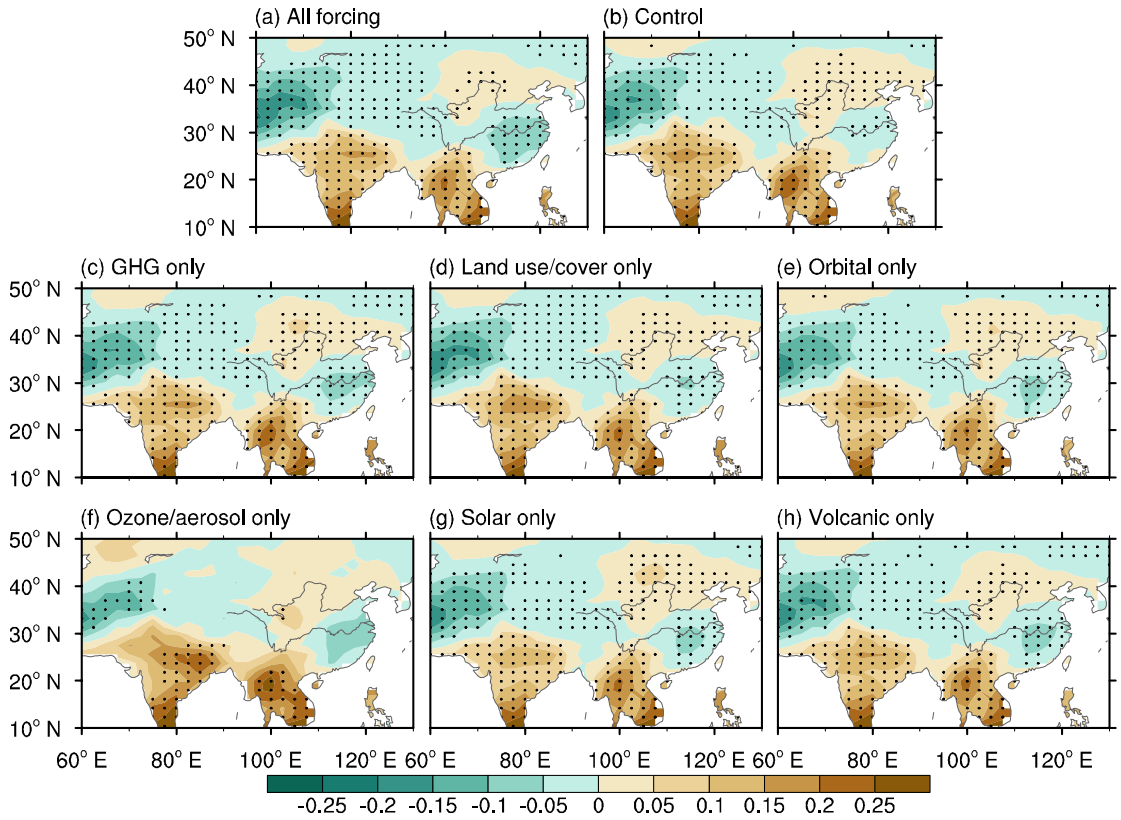

Fig. R1. Simulated PET anomalies during the positive phases of the IPO. The PET anomalies (units: mm day^{-1}) regressed onto the time series of the IPO index in the **(a)** all-forcing simulations, **(b)** control simulation, and **(c–h)** six subsets of the single-forcing simulations. The dots in part **(b)** show significant anomalies at the 95% confidence level and the dots in parts **(a, c–h)** denote that at least two-thirds of the members simulate significant changes (at the 95% significance level), and these significant changes agree on the sign of the average value.

Line by line comments:

Line 21 ('output' can be "outputs")

Response: Modification will be made accordingly in the revised manuscript! Thanks very much for your comment and suggestion!

Line 66 (‘EOF1’ can be “the first leading mode (EOF1)”)

Response: Modification will be made accordingly in the revised manuscript! Thanks very much for your comment and suggestion!

Line 67 (‘LMR’ can be “Last Millennium Reanalysis (LMR)”)

Response: Modification will be made accordingly in the revised manuscript! Thanks very much for your comment and suggestion!

Line 104 (‘this study will also utilize CESM…’ can be “this study also utilizes CESM…”)

Response: Modification will be made accordingly in the revised manuscript! Thanks very much for your comment and suggestion!

Line 254 (‘Last Millennium Reanalysis dataset’ can be “LMR”)

Response: Modification will be made accordingly in the revised manuscript! Thanks very much for your comment and suggestion!

Line 492 (‘abovementioned’ can be “aforementioned”)

Response: Modification will be made accordingly in the revised manuscript! Thanks very much for your comment and suggestion!

Line 558 (‘above-mentioned’ can be “aforementioned”)

Response: Modification will be made accordingly in the revised manuscript! Thanks very much for your comment and suggestion!