

## ***Interactive comment on “Quantifying the contribution of anthropogenic influence to the East Asian winter monsoon in 1960–2012” by Xin Hao et al.***

### **Anonymous Referee #1**

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Based on model simulation, this study attributed the weakening of the East Asian winter monsoon (EAWM) over the past decades to explore the contributions of anthropogenic forcing including greenhouse gases, anthropogenic and natural aerosols, ozone, solar, and land cover. Overall, the topic is clear and the manuscript is well-organized and easy to follow. However, I have several major concerns before the manuscript is suitable for publication.

1. Numerous studies have shown that the EAWM had been gone through a significant weakening in the past few decades. CMIP5 model output was often used to identify that the weakness of EAWM was the response to global warming in the current and

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future climate. Specifically, the change in the EAWM in future climate is considered to be a response to anthropogenic forcing. Compared to the previous studies, what is the new result from the current study?

2. This study is aimed to quantitatively estimate the contribution of anthropogenic forcing to the change in EAWM by one model output. It is hard to trust the results from a quantitative analysis of this type of study. Are the results robust or sensitive to models, especially the result shown in Fig. 5?

3. The introduction is not comprehensive and a number of relevant works have not been cited. On decadal time scale, the EAWM weakened in the late 1980s, but re-amplified after early 2000s (Wang and Chen 2014; Huang et al. 2014; Ding et al. 2014, 2015). For the causes of the decadal evolution of EAWM, many studies have shown that the changes in the Ural blocking and reduced Arctic sea ice are the main drivers (Wang and Chen 2014b; Mori et al. 2014; Luo et al. 2016).

Minor points:

1. The caption of Fig. 1d should be “Model-HGT”. 2. Model’s All-Hist runs can reproduce the climatology very well (Fig. 1), but fail to show the re-amplification of EAWM after early 2000s (Fig. 2a). It may lead to an overestimation of the contribution by anthropogenic forcing.

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