

Interactive comment on “The Warming Tibetan Plateau improves winter air quality in the Sichuan Basin, China” by Shuyu Zhao et al.

Anonymous Referee #3

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General Comments – This paper investigated the role of warming Tibetan Plateau on winter air quality in the Sichuan Basin, China. This paper has indicated that the air temperature in winter over the TP has risen by 2 degrees from 2014 to 2017. Then the authors used sensitivity experiments to examine the influence of the warming TP on air quality in the Sichuan Basin. This paper is well written and well organized. However, this manuscript has not provided any physical explanations for the linkage between warming TP and less air quality in Sichuan Basin. In fact, I doubt that the relation between warming TP and less air pollution is not a cause-and-effect relation other than a companion relation caused by atmospheric circulation. Based on the following comments, I will not recommend publication for this manuscript at current situation. Of course, the resubmission is encouraged.

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Major comments: 1, The description on the experiment design is too simple to be understood. How the authors set the temperature increment to 2 degrees? Only stations over the TP or all grids in the domain of the TP? please clarify this issue. 2, Please clarify the mechanism that the warming TP causes less air pollution in the Sichuan Basin. Please make sure whether the warming TP influence large-scale atmospheric circulation through air-land interaction? I think that the warming TP is a result other than a cause. 3, significance testing is important for your results. Please make some significance test for your results. For example, Fig. 5 and Fig. 6 show the difference between observations and simulations. Whether the difference between them is significant? Minor comments: 1, Fig. 7, please indicate the information of winds.

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