

## ***Interactive comment on “Impacts of atmospheric transport and biomass burning on the interannual variation in black carbon aerosols over the Tibetan Plateau” by Han Han et al.***

### **Anonymous Referee #1**

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This was an interesting work. The authors used GEOS-Chem model to investigate the origin of transported biomass burning aerosols over the Tibetan Plateau. Their results indicated the 47% of BC in the TP was from South Asia and 46% was from East Asia. Actually, I have suspected these quantitative results. Because the MODEL showed a quite coarse resolution of 2 X 2.5. So, this kind of evaluation probably had great uncertainties while the model in a such coarse grid space was used in a complex terrain (such as TP). A result based on the regional climate model evaluated the contribution of BC from South Asia was nearly 61% in monsoon season and 20% in non-monsoon season (Yang JGR, 2018). And another study that used a high resolution WRF-CHEM also indicated that finer resolution model could represent more reason-

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able performance (Zhang ACP 2020, Impact of topography on black carbon transport to the southern Tibetan Plateau during the pre-monsoon season and its climatic implication). Their results found the complex topography in the model could generate 50% higher transport flux of BC in Himalayas. That's why I had such doubt need to explain by the authors. The manuscript was generally well written and comprehensive. I also have minor comments as follows. a. The definition for the source regions. Xinjiang in the northwestern China should be belong to CAS b. For the model performance evaluation, the comparison between in-site and model were not make sense. I did not believe the model output in a such great resolution could represent the surface situation. Probably a supplement if the authors want to show their model was credible.

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