

***Interactive comment on “Spatial and seasonal variations of aerosols over China from two decades of multi-satellite observations. Part I: ATSR (1995–2011) and MODIS C6.1 (2000–2017)” by Larisa Sogacheva et al.***

**Anonymous Referee #3**

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The authors analyzed the AOD obtained from ATSR dual view observation jointly with MODIS DTDB results over China for the period since 1995. With such a long time series AOD data from two satellite sensors, the seasonal and inter-annual as well as spatial variation of 2 dataset are compared in details. The results would be useful for researchers who are interesting in the historical aerosol information over East Asia region and thus it is worth the publication. The reviewer’s concerns are mainly as below: (1) Over Sichuan basin, its higher AOD has been recognized for a long time. Several ground-based measurement studies also partly confirmed this high AOD region. From

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Fig.7, this feature is a major characteristic for MODIS results, while it is not clear for ATSR results. Are there validations or explanation on this underestimation? (2) Over Inner-Mongolia, there are large areas of desert and arid regions, about 1/3 of Taklamakan desert in size. It’s somewhat strange why ATSR results show nearly none of higher AOD values over this region. In comparison, MODIS results are probably more reasonable. Noticeably, in Fig 3(a), the “red” color region (difference large than  $\sim 0.2$ ) is also around this area. (3) As shown in Fig 9, the difference between two dataset depends on geolocations and seasons (Fig.11). Then, how does these two dataset (MODIS & ATSR) could be merged or used together in a continuous basis for a future analyses of long period variation, e.g. 1995-present, as suggested by authors in the summary part.

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