This article investigated the impact of aerosol optical depth on long-term variation of SSR under clear sky conditions in a typical megacity of China and highlighted the potential effect of anthropogenic activities on SSR changes. The paper was well organized. The results presented in this article are consistent with the general conclusions in recent studies focus on SSR changes in China, while provided more direct proofs about the close relation between aerosol and SSR. Applications of aerosol observation data such as AOD are very necessary, which has been paid more and more importance in “global dimming” and “brightening” studies. Several papers have revealed the SSR dimming and brightening phenomena in China, and most of them speculate the important role of aerosol on SSR transition from dimming to brightening, while the above mentioned presumption has not be sufficiently confirmed. This article used the hourly SSR measurements and MODIS retrieved AOD products to check their relationships for the first time in China, and provide the more sufficient evidence of the important role of aerosol on SSR. On the other hand, the statistical method used in this paper is rigorous and the samples are enough, based on which the conclusions are explicit. In general, the paper was well written. I would therefore recommend acceptance after minor revision.

My comments are only Minor in nature:

(1) MODIS can retrieve AOD in cloudy conditions, as long as there is no

cloud in satellite passage. Thus the authors should confirm that all the AOD data are collected under clear sky conditions.

(2) The authors should highlight the most important difference between this work and the previous studies (Che et al., 2005; Shi et al., 2008; Qian et al., 2007; Xia, 2010) in terms of the application of AOD products and high temporal radiation records in this article which are very important to investigate the role of aerosol on SSR changing.

(3) The dimming and brightening periods of DiSR have been mentioned by several studies over the world. According to the third period which was named as Re-dimming in this paper, is it consistent with or supported by other studies? Care should be taken to define a new terminology.

(4) In the future studies, if possible though it is very difficult, the author should investigate the relationships between AOD and SSR in a non-megacity nearby Shanghai, e.g. a relatively clean city to compare the situation of aerosol and SSR in areas with different air pollution level.

(5) Some references relevant to the regional climate change over East Asia:

a. Wu, Z., B. Wang, J. Li and F.-F. Jin, 2009: An empirical seasonal prediction model of the East Asian summer monsoon using ENSO and NAO. *J. Geophys. Res.*, 114, D18120, doi:10.1029/2009JD011733.

b. Wang, B., Z. Wu, J. Liu, C.-P. Chang, J. Li and T.-J. Zhou, 2010: Another look at climate variations of the East Asian winter monsoon: Northern and southern temperature modes. *J. Climate*, 23, 1495-1512.

c. J. Li, Z. Wu, Z. Jiang and J. He, 2010: Can global warming strengthen the East Asian summer monsoon? *J. Climate*, DOI 10.1175/2010JCLI3434.1.