

Atmos. Chem. Phys. Discuss., referee comment RC1  
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## Comment on acp-2021-324

Anonymous Referee #1

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Referee comment on "Decadal changes of connections among late-spring snow cover in West Siberia, summer Eurasia teleconnection and O<sub>3</sub>-related meteorology in North China" by Zhicong Yin et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-324-RC1>, 2021

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This study makes a full investigation about connection between snow cover/EU teleconnection and O<sub>3</sub> pollution in north China. The April-May snow cover in West Siberia was proposed as a preceding climate driver that influenced the summer surface O<sub>3</sub>-related meteorology in North China during 1980–1998, and the associated physical mechanisms were also explained by comparing the periods before and after the mid-1990s. The results of this study could provide a reference for the seasonal prediction of O<sub>3</sub>. This paper is well written and organized. I recommend it to be published in ACP after several minor corrections.

- Based on the content in the main text, the O<sub>3</sub>-related meteorology (OWI) is focus on summertime. I would suggest to clarify the specific season in the title, which will give a more direct expression about the seasonal prediction mechanism.
- The high level O<sub>3</sub> concentrations before mid-1990s are considered to be connected with the positive phase of EU teleconnection. While, after mid-1990s, the northward shift of snow cover results to the insignificant connections between snow anomalies, EU pattern and O<sub>3</sub>. What is the possible reason for the change point of mid-1990s? That is, why 1990s was selected as the turning point in this study. Is it based on the statistical analysis or some physical mechanisms?
- Some detailed information about the calculation of OWI index in Line 105 are suggested to add. E.g., how to normalize the meteorological variables. The absolute value of observed O<sub>3</sub> concentration and OWI should be included to indicate the robust of OWI.