

# ***Interactive comment on “Pan-Eurasian Experiment (PEEX): Towards holistic understanding of the feedbacks and interactions in the land–atmosphere–ocean–society continuum in the Northern Eurasian region” by Hanna K. Lappalainen et al.***

## **Anonymous Referee #2**

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Review for manuscript: Pan-Eurasian Experiment (PEEX): Towards holistic understanding of the feedbacks and interactions in the land–atmosphere–ocean–society continuum in the Northern Eurasian region” by Hanna K. Lappalainen et al. The article gives a comprehensive review of PEEX project in a very detailed way. Scientific issues of atmosphere and ecosystem due to environment change over Northern Eurasian regions and Arctic Ocean regions in the next decades are presented. Details are shown in separated sections, included the arctic-boreal natural environments how will play a

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crucial role in the global climate; hydrological and carbon cycle; nitrogen, sulfur and phosphorus cycle. Especially, according to the industry and economy increase of Eastern Asia, there is a huge demand for natural resources, for example, natural gas, coal, petroleum and minerals. Those anthropogenic activities will emit vast pollutants to the atmosphere, river, lake and ocean, which will cause local and regional air pollution, climate change. The Northern Eurasian regions and Arctic Ocean region will play a crucial role in the global climate. So a novel research approach is needed actually, which not only identifies and tackles the relevant multi-disciplinary research questions, but is also able to make a holistic system analysis of the expected feedbacks. In this manuscript, the authors introduced the research agenda of the Pan- Eurasian Experiment (PEEX) successfully. The review article will be a holistic supplement for other published PEEX papers after addressing the following aspects. I suggest that the paper should be published in ACP after minor revise. Major comments: 1. Page 48 Line 1314, you mentioned that 'Sulfur emissions in China are rapidly increasing', please give some references about it. As I know, the emission of NO<sub>2</sub> is increasing rapidly in China, while the increasing of SO<sub>2</sub> is complex after 2008 Olympic Games. Minor comments: Page 2 Line 76 : 'Graduate University of Chinese Academy of Sciences' as 'Graduate University of Chinese Academy of Sciences' Figure 2&figure 3, with low resolution, are not very clear as other pictures, please update them. Page 6 line189: spelling mistake of 'atmosphere'

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