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Interactive comment on "Seasonal variations in metallic mercury (Hg^0) vapor exchange over biannual wheat – corn rotation cropland in the North China Plain" *by* J. Sommar et al.

Anonymous Referee #1

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Comments to the manuscript:

"Seasonal variations in metallic mercury (Hg0) vapor exchange over biannual wheat – corn rotation cropland in the North China Plain " written by J. Sommar, W. Zhu, L. Shang, C.-J. Lin, and X. B. Feng Submitted to: Biogeosciences Discuss

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The manuscript "Seasonal variations in metallic mercury (Hg0) vapor exchange over biannual wheat – corn rotation cropland in the North China Plain" written by J. Sommar, W. Zhu, L. Shang, C.-J. Lin, and X. B. Feng is an original work. The objective of this manuscript was to address the role of crop vegetation as a source/sink of Hg0 based on

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an analysis of the measured difference between above-canopy and ground Hg0 fluxes. The authors also attempt to address the impact of field management activities (e.g. harvest, tillering and irrigation) and abrupt changes in environmental conditions (e.g. intensive precipitation) on Hg0 gas exchange. The experimental site Yucheng Comprehensive Experimental Station, managed by the Chinese Academy of Sciences, was used. This site is located in an alluvial plain in the lower 5 reaches of Yellow River, Shandong province, China. The topic covers an important issue which is relevant and of interest for an international audience. The topic fits well into the scope of Biogeoscience. The scientific approach of this study is adequate to achieve the objective. The methodology is basically sound and described in detail. Few additions are required. The manuscript is generally well-written. However, several issues need to be addressed and improved. The further hints may helpful for the revisions: Methodology: Concerning flux measurements: several other alternative flux measurements and the respective papers should be integrate into the methodology chapter of the ms.. such as Rinklebe, J. et al. 2009. Optimization of the simple field method to determine mercury volatilization from soils – Examples of 13 sites in floodplain ecosystems at the Elbe River (Germany). Ecological Engineering. 35. 319-328. And Böhme., F. et al. 2005. A simple field method to determine mercury volatilisation from soils. Environmental Science and Pollution Research. 12 (3), 133-135. Dynamics of Hg flux patterns & Environmental conditions: The authors should embed into the discussion of the dynamics of Hg flux patterns during various seasons and the linked environmental conditions the respective papers dealing with this issue. Rinklebe, J. et al. 2010. Dynamics of mercury fluxes and their controlling factors in large Hg-polluted floodplain areas. Environmental Pollution. 158. 308-318. During, A. et al. 2009. Mercury Volatilization from Three Floodplain Soils at the Central Elbe River (Germany). Soil and Sediment Contamination: An International Journal. 18. 4. 429-444. The Impact of variable temperature and moisture conditions. . .etc. Summarizing, it is a valuable paper which should be of interest for the respective scientific community. I recommend moderate revisions.

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