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Interactive comment on "Atmospheric wet and litterfall mercury deposition in typical rural and urban areas in China" *by* Xuewu Fu et al.

Anonymous Referee #2

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This study measured the Hg concentrations and deposition fluxes in precipitation and litterfall at six rural sites and an urban site across a broad geographic area in China. This is an important study and the results help us to better understand the spatial distributions of Hg deposition and mass balance of atmospheric Hg in China. The manuscript is generally well written. However, there are several issues to be clarified before the paper can be published at ACP.

Some specific comments are given below.

1. Line 145-146: Please give details of the sampling method, such as the type of wet-only collector used, sampling method, and key parameters of the collector. 2. Line 149-150: The authors said "Before each of the new sampling cycle, the borosilicate glass sampler was rigorously rinsed by Milli-Q water." Is the rinsing of Milli-Q water

ENOUGH to clean the sampler? 3. Line 178-180: Please give details of the literfall collectors, such as the design of the collector. The authors said the litterfall collectors are 0.25 to 1.0 m2. Why donot use same collectors? Why did you use four, four, three, and eight collectors instead of same number of collectors at the MCB, MDM, MLG, and MAL sites? 4. Line 224-226: This sentence says "VWM Hg concentrations in precipitation at all sites showed a clear season trend with higher concentrations in summer wet season and lower concentrations in winter dry season". However, the following discussions are totally opposite (higher Hg concentration in winter). Please clarify. 5. Line 227-231: 1) Does snow contain higher Hg? It will be interesting to see the Hg concentration data in snow only compared with that in rainfall. 2) The higher Hg concentrations in winter might be affected by the higher Hg emissions from coal combustion for heating in north China. Is it possible to analyze the impacts of heating from coal? 6. Line 231-235: The lower Hg concentrations in precipitation during summer might also be associated with the lower ambient Hg concentrations during summer owing to the higher wind speed and higher mixing height. I suggest the author to add some comparisons and discussions on this. 7. Line 253-263: It would be good to add a map showing the Hg concentrations in precipitation with both the data of this study and previous observations in China. 8. Line 333: "which is 4.4 times lower than the mean (24.8 $\pm$ 17.8 μg m-2 yr-1) at urban sites of China" shall be changed to "which is only 22.5% of the mean (24.8 $\pm$ 17.8 μg m-2 yr-1) at urban sites of China" 9. Line 454: The authors state that "indicating that litterfall deposition contributes significantly to the Hg deposition budget in China". Considering that this only applies to the forest area, it is suggested to change this sentence to "indicating that litterfall deposition contributes significantly to the Hg deposition budget in China forests".

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