

Interactive comment on “Total Atmospheric Mercury Deposition in Forest Areas in Korea” by Jin-Su Han et al.

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[Comment 1] Abstract is written in the way with number reporting, there is no significant conclusions and any new discovery. -> We revised the Abstract as follows on Line 34 to Line 51.

[Comment 2] Line 69-71, the original papers were not cited and PBM is particle-bound Hg, how can it be adsorbed on PM? You could say oxidized Hg or GOM. -> We revised text and reference as follows on Line 70 to Line 71 : “PBM is created by GEM or GOM adsorbing to a particle (Lai et al., 2011).”

[Comment 3] Line 72-74, re-write. -> We revised as follows on Line 71 to Line 74 : “..... Atmospheric PBM transport is significantly affected by its particle size distribution and may contribute to both wet and dry deposition (Lynam and Keeler, 2002). Wet and

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dry deposition of atmospheric Hg is an important input to the aquatic and terrestrial ecosystems”

[Comment 4] Line 84-86, not clear, also update the reference here Line 88-89 -> Wwe revised and updated this text as follows on Line 80 to Line 105.

[Comment 5] Line 77-79, add Selin et al., 2007 and Lindberg et al., 2007 -> We added Selin et al., 2007 and Lindberg et al., 2007 as follows on Line 77 to Line 79 : “.... , resulting in adverse health and ecological effects (Ma et al., 2013; Lindberg et al., 2007; Rolfhus et al., 2003; Selin et al., 2007; Weiss-Penzias et al., 2016; Zhu et al., 2014).”

[Comment 6] how does uptake via roots impact Hg deposition. Also stomatal uptake of Hg₀ emitted from soils? -> We added information as follows on Line 102 to Line 105 : “ root uptake of dissolved Hg in soil and soil water and stomatal uptake of GEM that was volatilized from soils (Bishop et al., 1998; Cocking et al., 1995; Ma et al., 2015; St. Louis et al., 2001). Recycled Hg would increase throughfall and litterfall concentrations (St Louis. et al., 2001).”

[Comment 7] I don't understand this sentence. Line 133, please discuss problems from using KCl coated quartz surface. Lyman et al., 2010; Huang et al., 2013/2015, McClure et al., 2015, Lynam and Keeler 2006 Sampling method, what are the time periods? -> We revised and discussed problems from using KCl coated quartz surface as follows on Line 141 to Line 154.

[Comment 8] Analytical method, did the author develop the thermal desorption method? If not please cite references. -> We added references as follows on Line 187 to Line 188 : “..... zero air passed through until the Hg concentration was zero (Kim et al., 2009; Kim et al., 2012).”

[Comment 9] If I understand this correctly, KCl QFF was heated to 525C and QFF was heated to 900C to separate GOM and PBM. Two questions here. 1. Is dry deposition

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collected up facing or down facing? and how up/down facing impact measurement? 2. Is this possible for GOM attach on QFF and quantified as PBM, and PBM attach on KCl-QFF and quantified as GOM? -> We added information about sampling method of dry deposition as follows on Line 141 to Line 154 and Line 192 to Line 193.

[Comment 10] What is the recovery for the thermal desorption system? Recovery for Tekran 2537 direct injection 87% is too low usually from 93-107%. How many sampling time periods? Only 4 field blanks? Why? Volatilization from soil, what are MDL or blanks? -> We revised section 2.4.1 and 2.4.4 as follows on Line 209 to Line 214 and Line 232 to Line 235.

[Comment 11] Section 3.1, if you only have a short time period during each season, how can you really see the seasonal pattern? Please add more detail information for sampling plan. -> We added information about sampling plan as follows on Line 241 to Line 242 : "Weekly sample were collected using quartz (PBM) and KCl coated quartz filters (GOM)"

[Comment 12] What statistical test are you using, please add information for every place you mention significant difference. -> We added information about significant difference as follows on Line 247, Line 265, Line 272, Line 290, Line 327, Line 396.

[Comment 13] Line 281, what is mechanical weathering? -> We revised as follows on Line 294 to Line 296 : "Other possible sources of Hg in throughfall are leaching and biogeochemical recycling of Hg from foliage (St. Louis et al., 2001)."

[Comment 14] Most references are also out of date. -> We added recent references.

Please also note the supplement to this comment:

<http://www.atmos-chem-phys-discuss.net/acp-2016-7/acp-2016-7-AC2-supplement.zip>

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-7, 2016.