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

Jin-Su Han et al.

nets2002@snu.ac.kr

Received and published: 4 May 2016

[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).”

[Comment 4] Line 84-86, not clear, also update the reference here Line 88-89 -> We 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
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