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## ***Interactive comment on “Air-snowpack exchange of bromine, ozone and mercury in the springtime Arctic simulated by the 1-D model PHANTAS – Part 2: Mercury and its speciation” by K. Toyota et al.***

**Anonymous Referee #1**

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Air-snowpack exchange of bromine, ozone and mercury in the springtime Arctic simulated by the 1-D model PHANTAS – Part 2: Mercury and its speciation K. Toyota<sup>1,2</sup>, A. P. Dastoor<sup>3</sup>, and A. Ryzhkov<sup>3</sup> Similar to Toyota et al's compendium manuscript (Air-snow exchange of bromine, ozone and mercury in the springtime Arctic simulated by the 1-D model PHANTAS – Part 1: In-snow bromine activation and its impact on ozone), they utilized their 1-D model with embedded multiphase air-snowpack physicochemistry to more accurately and precisely quantify polar tropospheric atmospheric mercury depletion events – specifically, focusing on the physicochemical mechanisms that govern AMDEs. Expounding upon their compendium manuscript, Toyota et al

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expands their chemical mechanism to take into account gas/aqueous phase mercury reactions (with appropriately parameterized temperature dependence, rate, and equilibrium constants). Therefore, one attains a comprehensive understanding of how AMDEs and ODEs simultaneously. I, therefore, recommend this manuscript as well for publication.

Please also note the supplement to this comment:

<http://www.atmos-chem-phys-discuss.net/13/C8442/2013/acpd-13-C8442-2013-supplement.pdf>

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Interactive comment on Atmos. Chem. Phys. Discuss., 13, 22151, 2013.

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