

## ***Interactive comment on “Atmospheric mercury speciation dynamics at the high-altitude Pic du Midi Observatory, southern France” by X. W. Fu et al.***

### **Anonymous Referee #2**

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The manuscript entitled “Atmospheric mercury speciation dynamics at the high-altitude Pic du Midi Observatory, southern France” by Fu et al., reported atmospheric Hg measurement data during one full year at a high altitude site in Southern France. GEM, PBM and GOM were monitored simultaneously using a well known Tekran speciated Unit. Meanwhile, CO and aerosol concentrations in the air were also monitored. The data qualities were well controlled. The authors analyzed in depth the events with high PBM and GOM concentrations. The authors found that High PBM events in cold seasons were mainly related to intrusions from the upper troposphere over temperate and sub-arctic North American and Arctic regions as well as the middle troposphere over the temperate North Atlantic Ocean and Europe, and that high GOM events were

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attributed to in situ production in the middle and lower free troposphere over the subtropical North Atlantic Ocean. This finding is of great importance for our understanding the global cycling of Hg in the atmosphere. The manuscript was well written and is easily understood. The manuscript should be published with minor revision. Major comments: The measurement technique used is the state of art method. However, the authors should add a paragraph in the introduction section about the limitation of Tekran 2537/1130/1135 system. This can be easily done by moving some of the information in section 2.2 to the introduction part.

Minor comments: Line 106: source points should be “point sources” Line 140: O3 should be O<sub>3</sub> Line 312: “significant” should be “significantly” Line 462: “other factors other” should be “other factors”

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