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Interactive comment on "A field intercomparison of three passive air samplers for gaseous mercury in ambient air" *by* Attilio Naccarato et al.

Anonymous Referee #1

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This papers describes tests of 3 different passive samplers for gaseous elemental mercury. These samplers are typically deployed for 8 to 12 weeks. I disagree with the first sentence in the abstract. They will tell us little to nothing. These samplers are only useful in contaminated areas and are not appropriate for monitoring. Gradients in air concentrations between the Northern and Southern hemisphere have been well documented. They are not highly variable. Thus, as for these helping meet assessment needs these samplers, because of the long sampling time will tell us nothing about the "presence and movement of mercury and mercury compounds in the environment." We know gaseous elemental mercury is ubiquitous in the air. These sampling systems will tell us little about transport and deposition or mercury compounds. The authors need to be honest about these methods and what information will be gained, for in my mind

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[Discussion paper]

this is little.

Abstract and throughout the paper what has been done should be described in the past tense. Line 28 remove both Line 46 remove highly Line 84 remove for the first time Lines 95, 189, 344, and 534 remove ", which" and replace with "that" Line 221 put a comma before because Comment on sampling rate calculation- this will depend on wind and possibly temperature and RH, and I am not sure how this is accounted for since this will vary by each location Line 264 you should put the value for each sampler and the standard deviation Paragraph that starts line 265. Were values measured by the two Tekrans the same? Typically they are systematically different. As you can see regarding the discussion of the data the Tekrans measured the variability while the passive samplers only measure the average and tell us little about the presence and movement of mercury or the compounds. Also please put the standard deviations in for each sampler. Are the values statistically significantly different between Italy and Canada using these samplers? I would expect Toronto to be a bit higher due to the fact it is a big city. Were the blank corrections subtracted for each sampling interval or just across the whole time? The former is the best way to do this and it is not clear in the text how this was done. Line 385 –how do you know which Tekran concentrations were right? Discussion regarding sampling rate. This demonstrates how this will be variable depending on conditions and they need a way to adjust for this. If you are at a remote location and are not collecting meteorological data how can you calculate the SR? If sites have different meteorological conditions and you have no Tekran system how will you know how accurate your values are? Given the low concentrations what will this information tell us? Basically nothing useful. Again... these passive sampling systems did not capture spikes. So what is the utility of these methods?

The authors should also look at the literature and discuss other passive sampling systems that have been tested for gaseous elemental mercury.