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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Effects of temperature and other atmospheric conditions on long-term gaseous mercury observations in the Arctic" *by* A. S. Cole and A. Steffen

Anonymous Referee #1

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The article present analyses of a GEM time series from Alert Canada and can be considered as an update of previous findings. Finally data from Amderma Russia is included in the discussion

The data are interpreted using good solid statistics and as such the article is straight forward.

For the first time a time trend in GEM has been documented which is very important for the understanding the dynamics of GEM and to constrain Atmospheric transport models. However the interpretation in is too tendentious in 1 case, see below.

Page 27168 line 6 and page 27170 line 15: It should be 13 years both places?

Section 3.2: In the discussion of the data from the two sites a map of the locations should be included and the geographical difference included in the discussion etc.

Page 27181 line 20 and the rest of the section: Here is discussed the R^2 of GEM concentrations and various parameters. T and Julian day could account for 22% of the variance. This is a very minor part it and great care should be taken in using this for prediction. First the correlation could be incidental and second it is therefore too tendentious use the correlation for predictions even with the statement indicates. Temperature increase in the period and GEM concentrations decrease is not the same as they are connected? This has to be proven before it indicates anything. So either remove from conclusion or come with further weakening of the statement. I will prefer the first.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 27167, 2009.