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Interactive comment on "Iodine monoxide in the Western Pacific marine boundary layer" *by* K. Großmann et al.

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Groβmann et al. report interesting MAX-DOAS measurements of iodine monoxide in the Western Pacific, complemented by GC/MS halocarbon measurements. These are consistent with similar measurements carried out by Mahajan et al. in the Eastern Pacific. The two studies now in ACPD have increased the understanding of iodine chemistry in the remote oceanic MBL, although the conclusions are perhaps more in line of iodine playing a less important role in the Pacific Ocean MBL than previously speculated. The results from both cruises also seem to be inconsistent with SCIAMACHY IO column maps over the Pacific.

I have a few suggestions for improving the discussion of the data. First, regarding the investigation of sources of reactive iodine by correlation with oceanic and atmospheric

physico-chemical variables, I would suggest using total reactive iodine (IOx=I+IO) rather than IO for performing this analysis. IO may not be a good proxy of IOx, since the IOx partitioning between I and IO depends on O3, and O3 varies very significantly along the cruise track (from 40 ppbv to below detection limit, which I assume is 1.5 ppbv rather than 15 ppbv as stated in the text). Since atomic iodine can be confidently modelled (its main fate in a clean environment is reacting with O3), it is easy to derive IOx as measured IO + modelled I. A back of the envelop calculation using the data in figure 7a and 7d suggests that at the equator the daily average [I]/[IO] ratio could be higher than 3, with [IOx]$\sim$4 pptv, while at the start and end of the cruise [IOx]$\sim$[IO]<=1 pptv. Note that the maximum daily average IO VMR reported by Mahajan et al. is 0.9 pptv, corresponding to IOx$\sim$1.2pptv (this needs to be corrected in table 1)

Also, apart from SST and RH, nothing is said about correlation with other meteorological variables or ocean physical variables which could have an influence on the ocean surface iodine source, such as wind speed, salinity, DOM, etc. An interesting observation in the Eastern Pacific study by Mahajan et al. was a positive correlation between IOx and salinity. Even though it looks like salinity was not measured in the TransBrom cruise, there are in situ salinity measurements available from the drifting floats of the Argo program which could be used for such comparison. Interesting for comparison with on-going laboratory investigations would be to report the slope of linear correlations between IO or IOx and SST and Salinity.

Finally, it would be informative to have some model estimations of how much ozone is depleted by the IO (and not shown BrO) levels reported, and if IO would be actually an important oxidant at these levels in the open ocean MBL.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 27475, 2012.