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Atmospheric Measurement Techniques
Discussions

# *Interactive comment on* "Measuring $SO_2$ ship emissions with an ultra-violet imaging camera" *by* A. J. Prata

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I acknowledge that the main problem with the use of the camera for SO2 ship emissions measurements is the use of a single filter. When the measurements were started (2009) it was not clear whether the camera would have sufficient signal-to-noise to detect the absorption by any absorber in the ship plume. Even though such cameras had been demonstrated to work well at volcanic SO2 plumes and also at industrial stacks, by several different researchers. The main issue was the very low SO2 content expected in the plume. It was also considered that, as the ships were moving, a fast sampling, high quality (good quantum efficiency) camera would be required and that a filter wheel system might not work well. The camera used is one of the most expensive



on the market and for the feasibility study, a dual camera system could not be justified. However, the paper tries to demonstrate that the system can produce reasonable results under good conditions (errors <50%) and is worthy of further development. The problem of particulates has been raised by all three reviewers and in fact was highlighted in the paper as the main cause of high bias in the results. I have emphasized this problem further in consideration of the reviewer's comments and include a separate Appendix showing one way this may be overcome.

I appreciate the reviewer's comments and hope that the revised paper makes the issues and potential solutions much clearer.

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