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Atmospheric Measurement Techniques Discussions



# *Interactive comment on* "A low power automated MAX-DOAS instrument for the Arctic and other remote unmanned locations" *by* D. Carlson et al.

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Comments/Changes, Referee #2:

We thank the reviewer for the comments. Some are slightly overlapping with the Reviewer 1 comments, so we have addressed some in our replies that reviewer. In addition to those, the comments of reviewer #2 have been addressed in the following ways.

Regarding referencing of the MAXDOAS technique, references to Wittrock et al. (2004), Irie et al. (2008), and Heckel et al. (2005) were integrated into the introduction of the paper to as studies contributing to the MAX-DOAS technique.

Regarding instrumental parameters, on P2353, line 7: The achieved instrument field of view is specified to be 0.5 to 1 degree. The precise FOV varies with wavelength because of using a chromatic optic (the lens) for focusing the light into the fiber. On P2355 line 9: The shape of the 334 nm mercury emission line is specified as being very close to Gaussian in appearance and measured within the wavelength region of interest for spectral fitting purposes. It only varies slightly at the nearby mercury lines.

P2360 line 8: It is specified that a more detailed treatment of the spectral fitting, including analyses using a single solar reference spectrum, is given in Donohoue et al. (in preparation). The authors feel that for the purposes of this instrumental paper Figures 6 and 7 demonstrate that meaningful spectral fits can be produced. Additionally, our interest is to discern boundary layer BrO abundances. By using a near temporally coincident zenith reference spectrum, stratospheric absorption signals are suppressed. Using a single near-noon spectrum requires fitting of large stratospheric ozone absorptions towards twilight and can in principle affect fitting of the smaller BrO features. Therefore, we use near temporally coincident zenith spectra for the reference.

P2355, line 21: The spectral drift of the spectrometer pixel to wavelength relationship due to temperature variations is discussed. It is indicated that spectral drift is minimized, allowing for quality spectral fits to be produced. The fitted spectral shifts are < +/- 0.01 nm on typical days, and the shifts applied on the date shown are also < +/- 0.01nm.

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Interactive comment on Atmos. Meas. Tech. Discuss., 2, 2347, 2009.