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Interactive comment on “Field deployable diode-laser-based differential absorption lidar (DIAL) for profiling water vapor” by S. M. Spuler et al.

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Field deployable diode-laser-based differential absorption lidar (DIAL) for profiling water vapor S. M. Spuler, K. S. Repasky, B. Morley, D. Moen, M. Hayman, and A. R. Nehrir

This manuscript is well written, illustrated, and presents new technology developments for ground-based water vapor (WV) measurements using the DIAK technique. I strongly recommend publication after correcting deficiencies identified below:

1) There is no discussion on the selection of the water vapor (WV) line for DIAL op-

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eration. While this work follows previous studies and developments it is important to provide the line parameters, selection criteria, and spectral info. 2) There is also no discussion of and treatment for the detector dark counts in the error analysis. This system employs long-term (1-10 min) signal averaging to capture low signal levels, and for this incorporation of dark counts and the associated error is important. At least they should discuss the magnitude of the dark current and compare it to low signal levels at long ranges in clean atmosphere in the mid-trop. 3) They have practically ignored systematic errors in treatment and application. Systematic errors—Doppler-Rayleigh broadening, self-broadening, spectral purity, temperature sensitivity in these DIAL measurements... have been widely presented in the literature and these are as important as random errors. Many of these are important in the widely changing boundary layer. At least a good discussion is needed on this and an estimate of this should be included in the total error. 4) Data processing (current and future) need to include known systematic errors. 5) There are typographical errors. These need to be corrected.

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