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Interactive comment on "Evaluation of the Airborne Quantum Cascade Laser Spectrometer (QCLS) measurements of the carbon and greenhouse gas suite – CO_2, CH_4, N_2O, and CO – during the CalNex and HIPPO campaigns" *by* G. W. Santoni et al.

Anonymous Referee #1

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The manuscript presents a very thorough evaluation of a direct-absorption pulsed quantum cascade laser spectrometer (QCLS). The work includes a brief but sufficient instrument description and a very detailed description of operating procedures, calibrations and intercomparison with other instruments. The thoroughness and degree of detail are laudable and excellent. It is apparent that the careful and thorough approach in the manuscript is also reflected in the instrument design and operation as

the performance of the QCLS is outstanding. One point that remains unclear, as the authors themselves state, is the discrepancy between the QCLS and CRDS methane measurements. Certainly, from the work presented here, no problem with the QCLS can be discerned. The work fits well in the context of AMT as it not only compares the performance of important instruments but also provides an excellent guideline for related work. In particular the approach of calibrations tied to NIST standards is valuable, although it is not applicable to all measurements. The manuscript is suitable for publication after consideration of the comments below:

My comments mainly reflect the quality of figures, which partially was rather poor.

Table 2b: The first column name seem rather cryptic, are they needed?

Figures: A general comment: Can the text labels, legends etc. be adjusted to a size that makes them legible? In many cases, even zoomed in I had difficulty with this.

Figure 1: Please increase font size.

Figure 3: Did the authors try reading this printed out? Even on the computer zoomed in it was rather difficult to discern Ph etc. The lines also could be thicker. The fact that it was nearly impossible to read this figure made it very difficult to follow the text in the related section.

Figure 4: Font size. Line thicknesses.

Figure 5: Font size

Figure 9 caption. I would recommend labeling the subplots and clearly stating which one is discussed in the figure caption. Also, increase font size in figures.

Figure 11-12: Font size

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 9689, 2013.