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Interactive comment on “A high ozone episode in winter 2013 in the Uinta Basin oil and gas region characterized by aircraft measurements” by S. J. Oltmans et al.

Anonymous Referee #1

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The paper describes measurements of ozone and precursors made in February of 2013 over the Uinta Basin in Eastern Utah, using aircraft and tethered balloons. Ozone mixing ratios increased to over 125 ppb during a stagnant meteorological situation. Large ozone values are attributed to trapping of local pollution in the valley and to enhanced photochemistry by snow cover in the valley. Previous studies have already shown this for this area as well as other, similar locations.

I recommend rejecting this manuscript on the basis of lack of data analysis. It is a fairly long-winded description of the observations without presenting a specific conclusion or new finding.

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The measurements presented here are very interesting and I can see some intriguing details in the collected data, but unfortunately none of this is picked up upon in the paper.

To give an example, the inhomogeneity of the precursors is never contrasted to the fairly even distribution of ozone in the valley at the end of the period. The separation of gas and oil wells is mentioned several times throughout the paper, but the clear difference between the correlations of precursors in the east and west sectors of the study area is never picked up upon. It appears from the correlation plots (Fig. 12) that the west side is enhanced in heavier hydrocarbons. Could this be the reason for more ozone being formed there despite lower overall precursors or is the high NO₂ in the east sector inhibiting ozone production?

How would the distribution look if Ox was used instead of ozone?

The correlation plots shown in figures 8-10 do not contribute any additional information that cannot visibly be extracted from the color coding of the flight tracks. Figures 13 through 15 essentially show ozone buildup over the observational period and the onset of venting on the last day but do not contribute anything else significant to the discussion.

Assuming that this data will likely be further analyzed with a photochemical model similar to the Edwards paper for the 2012 campaign, a (significantly shortened) version of this manuscript could be combined with such an analysis for a manuscript resubmission.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 20117, 2014.

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