

Interactive comment on “Flow rate and source reservoir identification from airborne chemical sampling of the uncontrolled Elgin platform gas release” by James D. Lee et al.

N. Cowern (Referee)

nick.cowern@ncl.ac.uk

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This is a significant and very well presented paper, clearly demonstrating the value of airborne plume sampling and analysis to guide decision making and rapid response to major hydrocarbon emission events.

One question that I do think still needs to be addressed in the paper is the apparently systematic variation in non-methane hydrocarbon ratios as a function of concentration, apparent in Fig. 7. For example, at a methane concentration of 1870 ppb the ethane/propane ratio appears to be around 5, while at 2020 ppb it is around 1.8. A similar, although weaker, trend occurs in the ratio between excess methane and ethane.

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This does not quite justify the statement on page 13 lines 4-5 of the manuscript, that the ratios between methane and NMHCs were consistent. From the presented data the reader cannot see whether these concentration-related ratio changes are caused by time-dependent changes as the plume weakened, by spatial effects within the plume itself, or some other effect. As this clearly has significance for interpreting the results it should be discussed in the manuscript, and if necessary Figure 7 extended in order to clarify this. For example, different symbols should be used to identify data from different flights, in order to clarify any time dependence of plume composition.

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