

Author's Response: Associate Editor Decision

September 29, 2023

1 Introduction

Introduction: it is good to hear about the positive development towards MethaneSAT, yet we should not forget that imaging spectroscopy has its limitations. The intro would benefit from short explanations on how MethaneAIR/SAT will cope with:

- variable or low surface albedo,
- the presence of aerosol in some of the plumes,
- the necessity to use CO₂ as a retrieval proxy, and
- the necessary instrument design tradeoff between high spectral and high spatial measurement resolution.

1.0.1 Author's response

While we believe that not all of these concerns should be incorporated into the introduction, we do acknowledge the existence of certain inadequacies in our explanations. We have addressed these concerns and integrated them into the paper as outlined below.

1.0.2 Author's changes

For the albedo, aerosol, and CO₂ proxy retrieval, please see lines 121 - 122 and 120 - 136. For the tradeoff, please see lines 42 - 45 in the introduction.

2 Figures

Figures 1 and 2 would benefit from displaying an arrow indicating the approximate wind direction.

2.0.1 Author's response

We can add that.

2.0.2 Author's changes

Please see the updated Figures 1 and 2.

3 MethaneAIR vs MethaneSAT Discussion

Furthermore, I agree with referee 2 that the discussion of differences between MethaneSat and MethaneAir is too short. You only changed "nearly identical spectroscopy" to "very similar spectroscopy", which is a too qualitative statement. It is important in the context of this manuscript to understand how well the results are transferable to MethaneSat - or not.

3.0.1 Author's response

We can comment more on the transferability and differences.

3.0.2 Author's changes

Please see lines 53 - 55 in the introduction and the comparison table in the supplement.