General comments:

This manuscript presents comprehensive analysis of the use of different UAV systems and calculation methods to quantify methane points emissions in an Arctic seep area. The two UAV systems were equipped with open-path and close-path methane instruments, along with two different onboard 2D anemometers. This study further compares methane emissions calculated using mass balance approach and Gaussian plume inversion, finding that the mass balance approach provides more robust quantification with smaller uncertainties.

Overall, this manuscript is suitable for AMT. My main concerns relate to how wind measurements were compared between onboard and ground-based anemometers. Since different wind measurements were used to calculate emissions, it is unclear how the results can be directly compared when different anemometers were applied. Please refer to the specific comments below. I would recommend publication after consideration of the following comments.

Specific comments:

1. Line 100-110, The two UAV setups used different 2D anemometers. The onboard instruments measure relative wind speed measurements (apparent wind). Was true airspeed measured on the UAVs? What is the impact of using different 2D anemometers on the emission calculations? How were wind measurements compared between onboard and ground-based measurements? (Line 110). Please clarify.

2. Line 218, how was the background concentration determined? Could the background level vary with altitude? The background concentration appears to differ is differ between UAV-MPI and UAV-NRCan. How large is the uncertainty associated with background concentration when calculating emissions using different methods?

3. In addition to the temperature (Appendix A), how stable was the pressure during flight? How might pressure variations affect the measurements?

4. Was the impact of water vapor on methane measurements considered? Were any drying systems or correction equations applied?

Technical comments:

1. Line 147, please correct "whichis"