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Methane super emitters are gaining importance for methane emission mitigation due to initiatives like EPA’s Super Emitter Response Program. In addition, many methane plume-mapping sensors are coming online (e.g., Carbon Mapper/Planet Tanager, EnMAP, PRISMA, EMIT, GHGSat, MethaneSat). For this array of instruments to be used together to understand methane emission rates and drive mitigation, we must define the detection limit for every instrument and have a robust interoperability framework for determining facility level emission rates and persistence. In August of 2023 the Global Airborne Observatory (GAO) and the Earth dust and Mineral InvesTigation (EMIT) collected co-incident observations of the same areas and plumes. These data allow for a unique opportunity with which to determine and verify the detection limits of EMIT and to develop and test a multi-sensor framework. We conclude that under favorable conditions the 90% probability of detection for EMIT is 700 kg/hr and the 10% probability of detection is 275 kg/hr. We also introduce a multi-sensor Bayesian approach for determining source persistence that we demonstrate with GAO and EMIT. Our study not only provides new insight regarding EMIT but also needed methods for multi-sensor interoperability.
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