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## Assessing Methane Detection Capabilities of Operational Satellite Sensors using Controlled Release Experiments

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Detecting, reporting, and mitigating fugitive methane leaks has been identified as one way of lowering national methane emissions in the United States. To that effect, the United States Environmental Protection Agency has launched a new super emitter program that relies on technologies that can detect and report methane leaks for mitigation. NOAA is exploring the option of utilizing its fleet of geostationary and polar-orbiting satellite sensors to operationalize the short wave infrared Multi Band Multi Pass methane detection algorithm developed by Harvard University. Prior to transitioning the technology to NOAA operations, a careful evaluation of retrievals from the two sensors, Advanced Baseline Imager on GOES-R series and Visible Infrared Imaging Radiometer Suite on JPSS series is needed. NOAA satellites can detect only large methane plumes (tons per hour) and benchmarking the capability is critical to work with stakeholders such as the EPA. To do that, NOAA is partnering with facility operators that conduct timed large methane releases during pipeline blowdown events to validate satellite methane detections and quantification of emissions. NOAA, in partnership with the Pipeline Research Council International, conducted its first pipeline blowdown experiment on October 8, 2024, deploying methane-monitoring technologies across ground, air, and space to track a controlled methane release. Three NOAA geostationary satellites viewing the plume from different geometries detected the plume along with various ground and airborne instruments - all systems reported methane flux estimates that are closer to the values reported by the pipeline operator. Results of this controlled release experiment will be presented along with plans to conduct additional experiments, jointly with NASA, to validate methane plumes from civilian satellite data as well as those detected by commercial plume mappers such as GHGSat, CarbonMapper, and MethaneSat.