



DATA.AIR Gen 1

Executive Summary

Document No. GHG-21850-6105

6 September 2024



1 SUBMISSION INFORMATION

Request Number	ALTTECH-21
Submission Date	2024-09-06
Company Name	GHGSat Inc.
Submission Point of contact Name	Jason McKeever
Product Name	DATA.AIR Gen 1
Technology Type	Airborne Mobile
Target Applicability	Broadly applicable across sector
Target Emission Leak Rate Threshold	13.6 kg/hr
Request Numbers of any connected submitted requests	

2 TECHNICAL SUMMARY OF TECHNOLOGY

GHGSat provides remote sensing of methane emissions, based on the principle of optical absorption spectroscopy. For the DATA.AIR Gen 1 product, the instrument is mounted on small aircrafts which survey the target facilities as they fly above them at a typical elevation of 10,000 ft above ground.

The GHGSat spectrometers collect ground-scattered solar illumination in the shortwave infrared (SWIR) portion of the electromagnetic spectrum. Methane concentration is inferred by monitoring light intensity at specific wavelengths that are absorbed by methane molecules.

The measurements are spatially resolved, providing a two-dimensional map of methane concentration enhancements with a ground sampling distance of ~1.5 m. This map is used to detect emission plumes and locate their origin. For each detected plume, the emission flow rate can then be calculated from the sum of detectable methane in the plume and gas dissipation rate at a given wind speed (integrated mass enhancement algorithm).

The technology has been deployed and field-tested at multiple locations in the United States and internationally. Its detection limit and quantification accuracy have been thoroughly validated in independent third-party studies.

3 UPDATES TO THE APPLICATION

Date	Description of Changes
2024-05-30	Initial submission to EPA
2024-09-06	Updated application



4 SUMMARY OF DOCUMENTS SUBMITTED

4.1 Description of Technology

Document Name(s) with extension	Document Description
GHG-21850-6101-b_description-of-technology-dataair1.pdf	(Updated) Document describing the physical principles, instrumentation, and processing algorithms used by the technology.
dataair-visual-workflow_b.pdf	(Updated) Diagram describing the flow of information through the processing pipeline.

4.2 Supporting Documentation

Document Name(s) with extension	Document Description
jervis-2021-amt-ghgsat-d.pdf	Peer-reviewed publication: measurement concept, instrumentation, and processing algorithms.
varon-2018-amt-quantifying-point-sources.pdf	Peer-reviewed publication: conversion from measured methane concentration to mass emission rate.
el-abbadi-2024-aircraft-controlled-releases.pdf	Peer-reviewed publication: third-party validation of the instrument detection and quantification performance.
mckeever-2022-white-paper.pdf	White paper: methodology quantifying the performance of methane remote sensors.

4.3 Formal Alternative Test Method

Document Name(s) with extension	Document Description
GHG-21850-6103-b_formal-test-method-dataair1.pdf	(Updated) Description of the test method following the EPA standard document convention.

4.4 CBI Submitted Documents

Document Name(s) with extension	Document Description
DATA.AIR Technical Orientation 04-2024.pdf	Onboarding documentation provided to customers.
GHG-21850-6106-b_supplementary-information.pdf	(New) Formal description of the physical model, algorithm, and subprocesses.
AVOps-00102-xx_FlightSheet.pdf	(New) Flight log template.