

# FULLY-AUTONOMOUS METHANE FLUX CHAMBER SYSTEM

Tech ID: 34532 / UC Case 2026-091-0

## PATENT STATUS

Patent Pending

## BRIEF DESCRIPTION

Quantifying greenhouse gas emissions is a critical component of climate change research and environmental management. To facilitate long-term, high-frequency monitoring, UC Berkeley researchers have developed a fully autonomous methane flux chamber system. This continuously and remotely operable technology integrates a specialized methane sensor and an automated pump system within a flux chamber to measure gas exchange between the ground and the atmosphere. The system features a controller that manages evacuation and fresh air intake cycles based on real-time sensor data. Equipped with its own power source, data storage, and network connectivity, the device can operate in remote locations and transmit measurement data to external servers without the need for manual intervention.

## SUGGESTED USES

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Climate Change Research: Measuring methane fluxes in remote wetlands, permafrost regions, or forests to improve global carbon cycle models.

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Landfill Monitoring: Tracking fugitive methane emissions from waste management sites to ensure regulatory compliance and safety.

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Agricultural Emissions Tracking: Quantifying the methane footprint of livestock pastures or rice paddies to develop more sustainable farming practices.

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Industrial Site Surveillance: Monitoring pipelines or natural gas facilities for leaks and persistent atmospheric emissions.

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Ecological Studies: Long-term observation of soil health and microbial activity through gas exchange analysis in various ecosystems.

## ADVANTAGES

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Remote Autonomy: Designed for continuous operation in isolated environments, significantly reducing the labor and travel costs associated with manual sampling.

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Real-Time Data Transmission: Integrated network connectivity allows researchers to receive and analyze flux data instantly from anywhere in the world.

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Optimized Sampling: The controller uses sensor feedback to intelligently manage pump operation, ensuring high-quality measurements and efficient power usage.

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High Durability: Engineered for long-term deployment, the system maintains functionality through varying weather conditions and extended durations.

## CONTACT

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## INVENTORS

» Zekkos, Dimitrios

## OTHER INFORMATION

### CATEGORIZED AS

» **Communications**

» **Wireless**

» **Computer**

» **Hardware**

» **Environment**

» **Other**

» **Sensing**

» **Sensors & Instrumentation**

» **Environmental Sensors**

» **Scientific/Research**

### RELATED CASES

2026-091-0

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Comprehensive Monitoring: Provides a localized, high-resolution view of methane dynamics that satellite or aircraft-based sensing cannot match.

## RELATED MATERIALS

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