

TOWARD ON-DEMAND MEASUREMENTS OF GREENHOUSE GAS EMISSIONS USING AERIAL ROBOTIC SYSTEMS

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New near real-time measurement methods are needed to detect, localize, and quantify emission sources of methane in rural and urban environments. Methane, a potent greenhouse gas produced by natural and anthropogenic processes, is an important target for mitigating climate change. Effectively reducing methane emissions produced by anthropogenic activity (e.g., oil and gas extraction, waste management, dairy farm operations, etc.) requires reliable attribution of methane emissions to sources. However, most conventional sensors, even those mounted on tall towers, do not reach beyond tens of meters above ground level when the daytime boundary layer is on the order of hundreds of meters and are often difficult and time-consuming to deploy. This talk presents the development and deployment of aerial robotic systems for localizing, identifying, and quantifying methane emissions from dairy farms located in the San Joaquin Valley of California, an imperative for effectively mitigating climate change.