

LA-UR-16-25164

Approved for public release; distribution is unlimited.

Title: W14_greenhousegas Multi-scale Atmospheric Modeling of Green House Gas Dispersion in Complex Terrain: Controlled Release Study

Author(s): Costigan, Keeley Rochelle
Sauer, Jeremy A.
Travis, Bryan J.
Dubey, Manvendra Krishna

Intended for: Web

Issued: 2016-07-18

Disclaimer:

Los Alamos National Laboratory, an affirmative action/equal opportunity employer, is operated by the Los Alamos National Security, LLC for the National Nuclear Security Administration of the U.S. Department of Energy under contract DE-AC52-06NA25396. By approving this article, the publisher recognizes that the U.S. Government retains nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or to allow others to do so, for U.S. Government purposes. Los Alamos National Laboratory requests that the publisher identify this article as work performed under the auspices of the U.S. Department of Energy. Los Alamos National Laboratory strongly supports academic freedom and a researcher's right to publish; as an institution, however, the Laboratory does not endorse the viewpoint of a publication or guarantee its technical correctness.



W14_greenhousegas

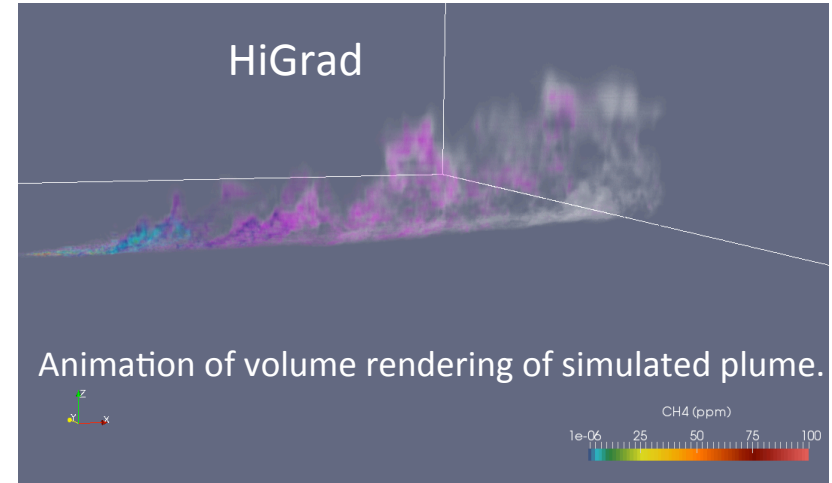
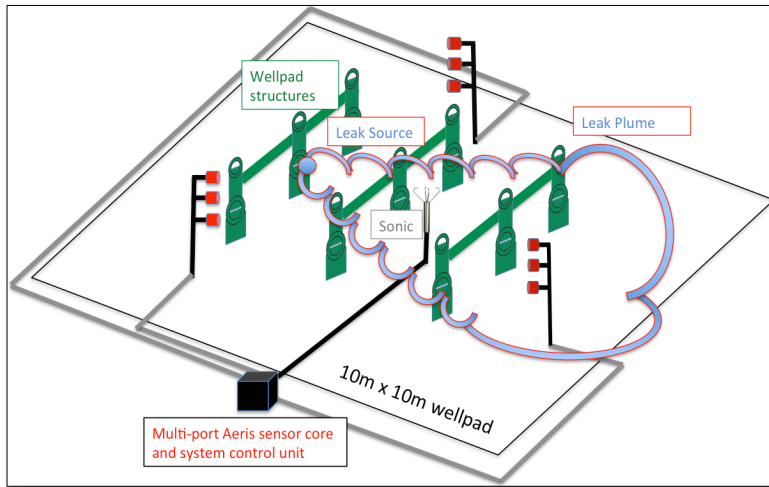
Multi-scale Atmospheric Modeling of Green House Gas Dispersion in Complex Terrain: Controlled Release Study

Keeley Costigan (PI), Jeremy Sauer, Bryan Travis, and
Manvendra Dubey

July 2016

LA-UR-16-?????

Affordable Artificial Neural Network and Mini-Sensor System to Locate and Quantify Methane Leaks on a Well Pad



ARPA-e project schematic for monitoring methane leaks.

1. Small, inexpensive sensors deployed in an optimal configuration
2. Meteorological measurements
3. **Artificial Neural Network (ANN)** diagnoses leak location and flux, from measurements and with negligible computational resources
4. Prior to deployment, computationally intensive **HiGrad** simulations provide training data for ANN

- Iterative training yields progressive reduction in error, through determination of node weights.
- Flexible implementation allows adjustments to training scheme.

