Progress in Evaluating Quantitative Optical Gas Imaging

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ABSTRACT

Development of advanced fugitive emission detection and assessment technologies that facilitate cost effective leak and malfunction mitigation strategies is an ongoing goal shared by industry, regulators, and environmental groups. Optical gas imaging (OGI) represents an important new class of emission survey tools that allow direct observation of normally invisible hydrocarbon and other air pollutant emissions from a variety of fugitive sources. OGI systems work in infrared (IR) spectral region, where molecules that make up the emission plume absorb or emit IR photons. Quantitative optical gas imaging (QOGI) refers to information gained from the OGI observation beyond simple leak discovery; primarily the measurement (or estimate) of emission rates using OGI systems. QOGI is considered an emergent technology area and is under development by several research groups and companies. Although powerful, QOGI is challenging from a method development standpoint because the operator is not in complete control of the test conditions and environmental factors can affect method performance. Development of robust procedures for assessment of data quality under real-world conditions is a particularly important aspect of QOGI method research. In June of 2015, two prototype QOGI systems were tested in a collaborative study at the EPA's optical remote sensing range in RTP NC. Using both known and unknown controlled gas release rates, simulated leaks of methane and propane were generated in variety of scenarios. This presentation provides an overview of QOGI Test 1 and progress towards defining factors that affect QOGI method performance.