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Direct Real-Time Measurement of Industrial Gas Flare Emissions

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Industrial Gas flares are used world-wide to reduce safety concerns in up-steam and down-stream production of hydrocarbon products. Hydrocarbon plants routinely rely on flare gas recovery units to improve plant efficiency and reduce environmental impact. Flares are designed to safely and efficiently burn flammable gases to minimize the impact of thermal radiation on surrounding equipment and work areas and to reduce ground level concentrations of combustion emissions. Monitors measure radiation levels, flare gas flow rates and compositions and ground level concentrations for CO, NOx, VOC's to characterize flare efficiency. Ground based instruments including Differential Absorption LIDAR (DIAL), Open-Path Fourier Transform Infra-Red Spectroscopy (OPFTIR), and passive FTIR (PFTIR) are subject to temporally and spatially varying flare plumes from a single source and measurements fail to capture the dynamic nature of flare operation under various ambient conditions. Also, none of these techniques have been applied to Multi-Point Ground Flares (MPGF) due to the flare field size and associated sampling limitations. Elevated Analytics has developed advanced sensor systems using fast acting sensors to directly measure local emissions in flare plumes. Measured data transmitted wirelessly from the mobile platform(s) links flare performance to plant operations. Real-time spatially and temporally accurate data is used to generate "time-varying" contour plots of local air quality and temperature to provide early warning of hazardous conditions and allows the plant to operate at maximum capacity without risking inefficient flare performance.

Biography:

Haider Al-Rubaye is currently associated with Missouri University of Science and Technology, USA in the department of Chemical Engineering.