Resolving Air Flow over Elevated Terrain to Improve Dispersion Modelling for Sour Gas Flares

Allan Chambers, Alberta Research Council
GL 564468

The objective of this project was to perform a combination of plume dispersion modelling and Differential Absorption Lidar (DIAL) tracking of an SO2 plume to resolve issues around dispersion modelling of atmospheric flows, especially when the plume approaches elevated terrain. DIAL measurements of the plume trajectory and behaviour as it approaches a hill would be collected under real atmospheric conditions and compared with numerically predicted plume dispersion and behaviour.

A field test program was completed at an operating sour gas processing plant in Alberta over a six-day period in September 2005. DIAL profiles of SO2 concentration in the plume from a tail gas incinerator stack were measured along the top of a ridge located about 1.5 km downwind of
the stack. The profiles were typically from measured

ground level to an elevation of 200 meters and between 50 and 1500 meters from the location of the DIAL unit. A mobile meteorological station was set up to measure wind speed and direction at the top of the ridge. A mobile satellite
communications unit was located at the site, enabling real-time plume dispersion modelling to occur during the DIAL measurements.

Final Report
Disclaimer

2005 Presentation