Real time Airborne gas detection using Thermal Hyperspectral Imaging.

Stephane Boubanga Tombet, Alexandrine Huot, Frédérick Marcotte, Vincent Farley, and Martin Chamberland
Telops, Research, France (stephane.boubanga@telops.com)

Gas leaks and air pollution sources present to a certain extend health, safety and environmental risks. A history of crisis management in the Upstream has shown the value of efficient and accurate tools for detecting gas leakages and/or the characterization air pollution agents. Knowing about the existence of a leak or the existence of an environmental thread is not always enough to launch a corrective action. Additional critical inputs such as the leak source, the chemical nature of the gas cloud, its direction and speed and as well as the gas concentration must most of the time be gathered in a short amount of time to help securing the hazardous areas. Most of the time gas identification for gas leaks surveys or environmental monitoring purposes involve explosives and/or toxic chemicals. In such situations, airborne measurements present particular advantages over ground based-techniques since large areas can be covered efficiently from a safe distance. In this work, we present our recent results on real time airborne gas detection up to 4600 feet above the ground using thermal hyperspectral Imaging technology. The Fourier transform technology used in the longwave (8-12 µm) hyperspectral camera on an airborne platform allows recording of airborne hyperspectral data using mapping and targeting modes. These two acquisition modes were used for gas imaging a ground-based ethylene, Methanol and acetone gas release experiment. Real time quantitative airborne chemical images of the three gas clouds were obtained paving the path toward a viable solution for gas leak surveys and environmental monitoring.