

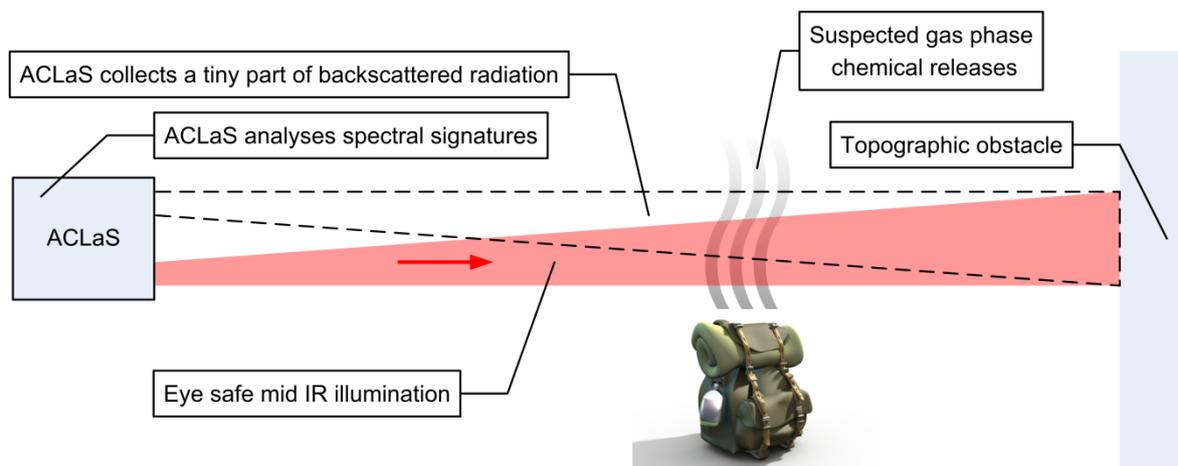
How Space Technologies Can Help Detect Terrorist Bombs

The recent terrorist incidents at the Boston marathon in the US have highlighted once again the real danger to people from terrorist bombs and chemical attacks. Ideally the security forces would like an instrument they could point at a crowd to see, from a distance, whether someone is carrying such materials before the damage is done. Fortunately, help is on hand from the Space Sector.

For many years, researchers into climate change have been trying to measure the levels of greenhouse gases in the atmosphere. To do this, they have developed a range of instruments for remote sensing which are flown on satellites and which can measure the very low concentration of these gases at great accuracy across large distances. These instruments use a range of techniques to do this, including Radar and Lasers.

Conveniently, explosives and hazardous chemicals also emit tiny amounts of gaseous chemicals and these can be detected using the same instruments. Scientists based at the Rutherford Appleton Laboratories have now taken one of these instruments, called an 'Active Coherent Laser Spectrometer', and have adapted it to work in terrestrial applications such as detection of explosives.

Its operation is very simple in principal. A laser light, safe for the human eye, is pointed at the area of interest. The light is reflected of buildings and other surfaces and reflected back to the instrument. If explosives or chemicals are present in the line of sight, these will change the properties of the light, and this change is measured to work out which explosives are present.



This remote sensing technology has already been demonstrated at up to 50 metres and will be able to operate up to several hundred metres. It provides unambiguous identification and quantification of the highly specific chemicals released by different explosives, gives a rapid response time, is eye-safe, compact, robust and cost effective.

In addition to detecting explosives, the instrument has a wide range of other terrestrial applications. It can be used by the Fire Services to check for hazardous chemicals at

accidents and fires; by the military to monitor for chemical warfare agents; by the environment agencies to remotely monitor pollution from factories, and by local councils to measure air quality.

The Centre for Earth Observation Instrumentation (CEOI) is funding a wide range of innovative new instruments that measure our weather, our atmosphere, the icecaps, and many other aspects of the natural environment. Many, like the 'Active Coherent Laser Spectrometer' are finding fascinating new applications in everyday life.

Further information about this technology and others funded by the CEOI can be found at www.ceoi.ac.uk. You can also contact the Project Lead, Dr Damien Weidmann, STFC Rutherford Appleton Laboratory: Tel: +44 (0)1235 445804, or email: damien.weidmann@stfc.ac.uk , or the CEOI Director, Professor Mick Johnson: Tel: +44 (0)1438 774421 or email: mick.johnson@astrium.eads.net.