

Torch-sized devices will detect disease and weapons

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Researchers at the University of Essex have been awarded almost £1.2 million as part of a programme to develop a new generation of portable, handheld radiation detectors that could have a range of potential applications from disease diagnosis to weapons detection.

The new devices, which would be the size of a normal torch, will detect radiation in the THz (terahertz) region of the electromagnetic spectrum. It is hoped they could be used in applications such as screening for explosive chemicals or drugs to help with security and crime prevention, to look for pollution in the local environment, and by doctors to help diagnosis.

The collaborative project, funded by grants from the Engineering and Physical Sciences Research Council totalling £2 million, is being conducted by a team of researchers in the Department of Electronic Systems Engineering in collaboration with academics from UCL (University College London), the Universities of Bath and Leeds, and the Centre for Integrated Photonics Ltd in Ipswich.

Professor Henning, who is leading the team, explained: 'THz radiation falls between the infrared and microwave regions of the electromagnetic spectrum and can be imagined as either very high frequency radio waves, or as light which is invisible to the naked eye.

'For a long time it has been quite difficult to generate and detect THz, but, in recent years people have used large, powerful lasers to create

pulses of THz radiation. This has proved very useful in medical applications to build up pictures of body tissue, rather like an x-ray, which can show up abnormalities. However, such devices require a large power supply and are usually bulky. With a small, low power device, which can run off batteries, the possibilities for practical applications open up enormously.'

Other interesting areas for application include using THz in fossil imaging, analysing chemicals in gases, and as part of astronomical observations.

The Portable Terehertz Systems Based on Advanced InP Technology (PORTRAIT) project is due to be completed in 2008.

Source: University of Essex

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