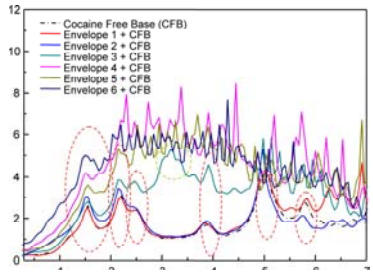
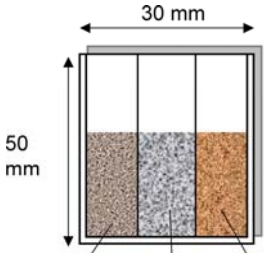
BASIC SCIENCE

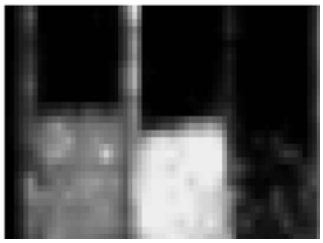
To advance new applications of Terahertz (THz) radiation, TeraNova is also undertaking a small number of programmes in basic science. These programmes complement activities in the development of new functional components and in the realisation of prototype systems.

Detection of Contraband and Imaging of Powders

- Terahertz radiation provides clues about the presence of drugs and explosives hidden below clothing. This is because the characteristic movements of groups of large molecules, such as those found in contraband, occur at THz frequencies. The pictures below show spectra (below: left) of a number of samples of a cocaine compound hidden in a "Fedex" envelope. Understanding THz propagation through composite materials is also of great importance and TeraNova has developed mathematical models of how this radiation is scattered in powders and textiles. THz radiation can be used to image powders of different sizes in a container (below: middle and right). This will be very valuable in the production of chemicals and pharmaceuticals.

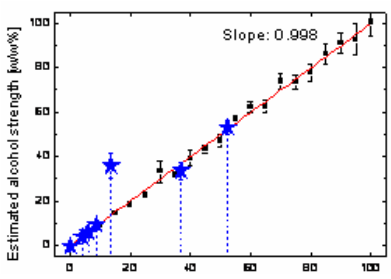






Non-destructive Testing and Applications in Food Technology

- THz sensing systems based on our optical technology can be used for a variety of non-destructive testing applications in many areas where the characteristic penetration, sensitivity and resolution are appropriate. THz radiation can be used to determine the strength of alcoholic drinks. In the left hand diagram blue stars are data from commercial alcohols (beer, wine, whisky and absinthe).



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