



Knowledge Transfer Networks Accelerating business innovation; a Technology Strategy Board programme

Optical fibre technology delivers user friendly and affordable monitoring systems for civil engineering and healthcare

The integrity and the health of large structures such as dams, buildings and bridges and of aircraft wings or helicopter blades have a high impact on the safety of all citizens. It is therefore of broad interest to deploy effective, easy to use and affordable monitoring systems, which can warn at a very early stage of any possible failure, anomaly or danger. At the same time, the ageing of the population urgently requires improved healthcare. Providing means for the long term monitoring of respiration and cardiac activity, for enhanced rehabilitation following trauma or surgical interventions, as well as for the detection of pressure points under bed-ridden patients, are amongst the most important demands.

Solutions for the aforementioned requirements in civil engineering and healthcare are provided by advanced optical fibre sensor technology combined with the latest developments in flexible electronic and opto-electronic circuits. The recently launched PHOSFOS project (**Photonic Skins For Optical Sensing**) funded by the European Commission is developing new flexible and stretchable skin-like polymer sheets that are sensitive to various degrees of touch, pressure and deformation. The functionality is provided by optical sensing systems that rely on specialty glass and polymer optical fibres interfaced with the necessary optical sources and detectors, all integrated into the flexible sheets. Whereas the measurement itself requires delicate optical fibres, the output of the sheets will have a simple electrical connection. These sheets can be adapted to meet the specific needs of the application field, both for structural monitoring and for health monitoring.

Partners from all over Europe have teamed up to design, fabricate and test the system. The project is coordinated by the Vrije Universiteit Brussel (Belgium) and gathers important contributions from other Belgian institutes (IMEC and Ghent University); the UK (Aston University); Poland (Wroclaw University of Technology and Marie Curie-Sklodowska University), and Cyprus (Cyprus University of Technology). Two Small-Medium Enterprises, FOS&S (Belgium) and Astasense Ltd. (UK) will incorporate the developments in their technological portfolio.