

EPSRC supported EngD project: characterisation of multiphase formulated and complex fluids using process tomography

Prof Mark Simmons (University of Birmingham)

Industrial Tomography Systems (Manchester)

Tax free bursary of £18,800 p.a. plus fees

Complex multiphase liquids, such as emulsions and non-Newtonian particulate solid/liquid continuous mixtures form the basis of products sold in a wide range of process sectors including mineral, food and pharmaceutical industries. The performance of these products depends on achieving a target microstructure which is largely dependent on the process history. As processes become increasingly intensified, a critical requirement is for online monitoring of product attributes – the “holy grail” being determination of critical properties in concentrated opaque mixtures.

The project explores the inference of suspension microstructure and flow from industrially-based measurements using innovative electrically-based process tomography instrumentation. The sponsoring company, Industrial Tomography Systems Ltd (ITS), is a SME which specialises in the manufacture and application of such instrumentation into process industries. The student will have the opportunity to work in a small company atmosphere which provides for high levels of responsibility and self-management; whilst engaging with blue chip process companies who are already making use of process tomography through a major multi-disciplinary project involving Unilever, Johnson Matthey, ITS and the Universities of Birmingham and Manchester.

The project will involve application of ITS based technologies to

- single and multi-components slurry mixtures, as used in hydraulic dredging and transport and in minerals processing;
- colloidal slurries where the properties of the continuous phase and particle size distribution have a fundamental impact on the behaviour of the solid particulates;
- High phase volume emulsions often encountered in foods also involving surfactant meso-phases in home and personal care products.

To be eligible for EPSRC funding candidates must have at least a 2(1) in an Engineering or Scientific discipline or a 2(2) plus MSc. Applications from EU students who have studied in the UK are welcome as well as those from candidates with three years relevant industrial experience. Please email your c.v to chem-engd@contacts.bham.ac.uk. For more details on the Engineering Doctorate scheme please visit www.eng.bham.ac.uk/chemical/pg/engd.