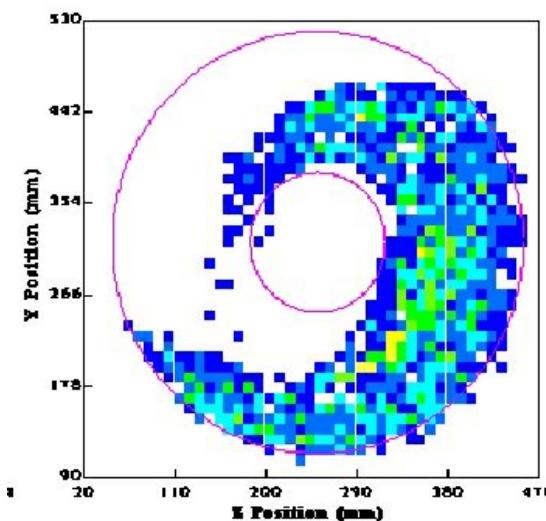


Industrial Positron Emission Tomography (PET)

PET (Positron Emission Tomography) is arguably the most powerful functional imaging modality in medicine but, because of its high cost, relatively few major hospitals can provide it. At Birmingham we have the equivalent of four PET scanners used to image flow inside engineering equipment, a field which Birmingham has pioneered for over 20 years.

PET uses short-lived radioisotope tracers whose distribution is determined by detecting the pairs of back-to-back gamma-rays emitted when a positron (anti-electron) annihilates a normal electron. Conventional PET produces 3D maps of tracer concentration, but most of the work at Birmingham uses the alternative technique of positron emission particle tracking (PEPT), invented and developed here, whereby a single small radioactive tracer particle is tracked at high speed. With the current technology, a 100 mm particle can be located every millisecond to within 1mm (in 3D). Studies can be performed on real equipment (the gamma rays will emerge through over 1cm steel) enabling industrial process operators to see, for the first time, exactly what is going on inside their plant.



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