



John Adams Institute for Accelerator Science Lecture Series

Wednesday 22nd February 2017 at 4:15 pm
Dennis Sciama Lecture Theatre, Denys Wilkinson Building

Medical Imaging with Ionizing Radiation: Current Challenges and Future Opportunities

Gil Travish
Chief Science Officer, Adaptix Ltd.

Abstract:

Medical imaging allows for diagnosis of a wide range of medical conditions, as well as the planning and execution of interventions. Most, perhaps all, medical imaging modalities rely on basic physics and find their genesis in physics experimental techniques. I will briefly survey these methods and their underlying physics, with a focus on x-ray imaging. The availability of digital detectors, computing power and new algorithms offers incremental improvements on many established methods, but presents challenges in optimally applying these resources. I will describe the efforts in creating sources with suitable capabilities (e.g. distributed arrays, higher brightness, narrow bandwidth, etc.) that do allow for such improvements. In the longer term, less-explored physical processes (e.g. correlated photon pairs) and extensions of current methods to include, for instance, spectral information and phase contrast offer new opportunities for medical imaging and the prospect of improved diagnostics and healthcare. I will cover some of these short-term challenges and then speculate on what long-term prospects might come from imaging approaches based on under-exploited physics.

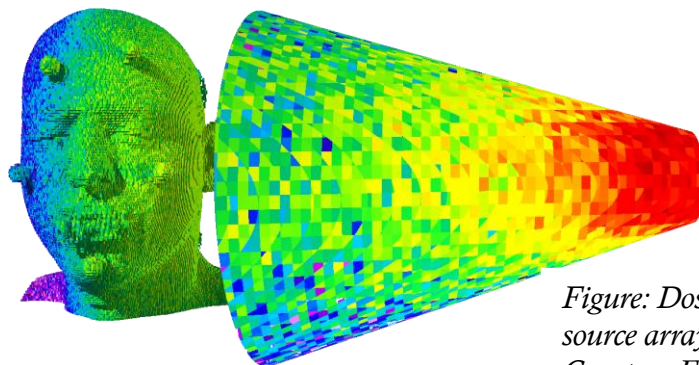


Figure: Dose profile of a distributed source array using Fluka simulations. Courtesy Eleftherios Skordis (CERN and University of Liverpool).

For further details contact Glenn Christian: glenn.christian@physics.ox.ac.uk