

Nikos Katzourakis (Reading)

Inverse optical tomography through PDE-constrained optimisation in L^∞

Abstract

Fluorescence Optical Tomography (FOT) is a novel evolving biomedical imaging methods that is currently intensely researched. FOT attempts to reconstruct interior optical tissue properties using light as opposed to the more frequently used harmful ionising X-rays. FOT improves on a number of shortcomings of established medical imaging techniques, being more precise and with no side effects for humans. Unfortunately, despite its significance, the poor mathematical understanding of FOT on behalf of the applied medical and computational scientists who have considered it forces them to use ad-hoc unjustified empirical methods. In this talk I will discuss the mathematical rigorous foundations of this important inverse problem first laid by the speaker in recent work, through novel tools of the very modern area of Calculus of Variations in L^∞ .