Approximation Errors and Model Reduction in Optical Tomography

Ville Kolehmainen
Department of Physics,
University of Kuopio,
Finland.
Ville.Kolehmainen@uku.fi

Abstract

Model reduction is often required in optical diffusion tomography (ODT), typically due to limited available computation time or computer memory. In practice, this often means that we are bound to use sparse meshes in the model for the forward problem. Conversely, if we are given more and more accurate measurements, we have to employ increasingly accurate forward problem solvers in order to exploit the information in the measurements. In this talk we apply the approximation error theory to ODT. We show that if the approximation errors are estimated and employed, it is possible to use mesh densities that would be unacceptable with a conventional measurement model.