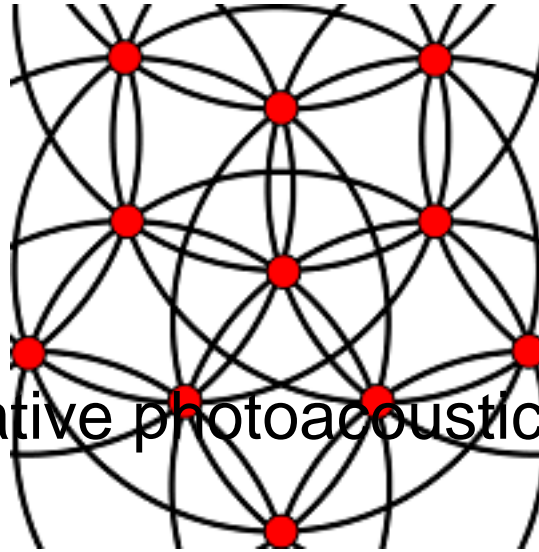


CSASC 2013



Contribution ID : 94

Quantitative photoacoustic imaging

Content :

Photoacoustic imaging is a hybrid tomographic technique based on the photoacoustic effect. Tissue irradiated by a short laser pulse generates an ultrasound signal (due to thermal expansion) which can be measured by ultrasound transducers. From these measurements, the ultrasound initial pressure can be reconstructed uniquely by photoacoustic inversion. The goal of quantitative photoacoustic imaging is to determine spatially varying optical material parameters (absorption and scattering coefficients) from these initial pressure data, a highly ill-posed problem. Recent works on this subject showed that in general, unique reconstruction is impossible. To overcome this problem, we propose a restriction to piecewise constant parameters, for which the problem can be shown to admit a unique solution.

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Session classification : --not yet classified--

Track classification : Numerical Methods for Partial Differential Equations

Type : Oral presentation