A fast direct algorithm for photoacoustic imaging

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Photoacoustic tomography is a rapidly developing modality for in vivo imaging. Analogously to the Radon transform for computerized tomography, the spherical mean value operator is the crucial ingredient in this modality. Recovery of image data from photoacoustic measurements hence asks for the inversion of this operator. For a specific geometry, we present a reconstruction formula and discuss its discretization on a so-called polar grid which enables the use of the fast Fourier transform in order to get an efficient algorithm. In the last part of the talk we show some numerical examples.