

Inversion of the spherical means transform with centers lying on corner-like surfaces by reduction to the classical Radon transform

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In photo- (or opto-) acoustic tomography an acoustic wave is generated within an object of interest in response to a short laser pulse. To form an image, one reconstructs the initial acoustic pressure from the time series measured on a surface (completely or partially) surrounding the region of interest. Currently, explicit reconstruction formulas are known only for a few simple measuring surfaces. In the present talk we consider certain corner-like acquisition geometries popular among practitioners. Our exact reconstruction formulas allow one to recover from the measurements the classical Radon projections of the sought function, in the cases when the pressure is measured on the boundary of an infinite octant (in 3D), or on the boundary of an infinite angular sector (in 2D) with the opening angle equal to π/n , with $n = 1, 2, 3, \dots$. Methods for recovering of a function from its Radon projections are well-known.