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A symmetric integral identity for Bessel functions with applications to integral geometry.
(English) [Zbl 1422.53063]

Exhaustive references enumerate the developments of the theory of the spherical mean transform. Brief
description on the spherical mean transform for the Euclidean space and the eigenfunctions for the Bessel
functions of the first and second kind are introduced, which are analogs to [H. S. Cohl and H. Volkmer, J.
Inverse Probl. 23, No. 1, 373-383 (2007; Zbl 1127.44003)] with slight modifications with regard to methods
for elliptical coordinates. A symmetric integral identity, as an explicit inversion formula for the spherical
mean transform, is obtained where data is considered on the cylindrical surface. Theorem 2.1 shows the
recovery of a continuous function \( f \) from the spherical mean transform, where the circles of integration
have centres over the ellipse. It is claimed that in the proof of Theorem 2.1, follows the same method
that was introduced in [loc. cit.]. The exact formulation for this is formed and and proved in Theorem
2.2. Theorems 2.1 and 2.2 are formulated in Section 2, proofs of which are given in Section 3.

Reviewer: Deshna Loonker (Jodhpur)

MSC:
53C65 Integral geometry
53C10 G-structures
44A12 Radon transform

Keywords:
spherical mean transform; integral identity; Bessel functions

Software:
DLMF

Full Text: DOI arXiv

References:
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