

# On X-ray transform of symmetric tensor fields

Alexander Denisjuk

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## Abstract

The X-ray transform  $I$  associated with a covariant symmetric tensor field  $f(x)$  of order  $m$ ,  $x \in \mathbb{R}^n$ , the function  $If(l)$  by integration over the line  $l$ . It is well-known that  $I$  has non-trivial kernel (for  $m > 0$ ). So, the inverse problem is posed to recover some projection of  $f(x)$ , e.g. the solenoidal part or the Saint-Venant operator of  $f$ . On other hand the inverse problem is overdetermined (for  $n > 2$ ). Thus the reconstruction problem from incomplete, i.e. known only for  $n$ -dimensional family of lines, data arises. We will discuss exact inversion formulas for both, complete and incomplete data cases. We will also show how one can use this results to investigate the X-ray transform of symmetric tensor field in spaces of constant curvature.