



# International Journal of Biomedical Imaging

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### Research Article

## The Formula of Grangeat for Tensor Fields of Arbitrary Order in n Dimensions

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### Abstract

The cone beam transform of a tensor field of order  $m$  in  $n \geq 2$  dimensions is considered. We prove that the image of a tensor field under this transform is related to a derivative of the  $n$ -dimensional Radon transform applied to a projection of the tensor field. Actually the relation we show reduces for  $m=0$  and  $n=3$  to the well-known formula of Grangeat. In that sense, the paper contains a generalization of Grangeat's formula to arbitrary tensor fields in any dimension. We further briefly explain the importance of that formula for the problem of tensor field tomography. Unfortunately, for  $m>0$ , an inversion method cannot be derived immediately. Thus, we point out the possibility to calculate reconstruction kernels for the cone beam transform using Grangeat's formula.