

On the Differentiated Backprojection method for the inversion of the X-Ray Transform with truncated data

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In two and three dimensions a formula to invert the finite Hilbert transform has been used in [1] and [2] to recover the density function in some region by knowledge of the X-Ray transform on a reduced set of lines only. This differs from the traditional inversion formula which requires the X-Ray transform over all the lines. In the class we will discuss the ideas presented in the papers of how to obtain the Hilbert transform from the X-Ray transform data and how to recover the density function by means of an inversion formula of the finite Hilbert transform.

References

- [1] F. Noo, R. Clackdoyle, J.D. Pack, "A two step Hilbert transform method for 2D image reconstruction". *Phys. Med. Biol.* 49 (2004), pp. 3903-3923.
- [2] J. Pack, F. Noo, R. Clackdoyle, "Cone Beam reconstruction using the backprojection of Locally filtered Projections", *IEEE Trans. Med. Imag.* 24 (2005), pp. 70-85.