

Inverse problems for reconstruction in tomography

vendredi 20 avril 2012 10:50 (25 minutes)

Iterative reconstruction in tomography, based on inverse problems approaches, have long proven their potential to enhance reconstruction quality, compared to the filtered backprojection (FBP). The drawback of iterative methods is their expensive computation time. However ongoing researches on algorithms and recent enhancements in computational power, call for a re-evaluation of the potential of iterative reconstruction in this domain.

I will present the advantages of using the inverse approach in tomographic reconstruction. A key point is the data modelization, i.e. the numerical model of projection, which has to be sufficiently accurate to ensure accordance to the data, while not enhancing too much the computational burden. Combining the minimization of data residuals with an adequate regularization term can allow to drastically reduce the angular sampling of projections without any loss of quality.

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Classification de Session: Tomographic reconstruction methods

Classification de thématique: Inverse problem in Applied Mathematics