

## International Journal of Biomedical Imaging

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## A Prospective Study on Algorithms Adapted to the Spatial Frequency in Tomography

Vincent Israel-Jost,<sup>1,2</sup> Philippe Choquet,<sup>2</sup> and André Constantinesco<sup>2</sup>

<sup>1</sup>Institut de Recherche Mathématiques Avancées, 7 rue René Descartes, Université Louis Pasteur, Strasbourg Cedex 67084, France

<sup>2</sup>Service de Biophysique et Médecine Nucléaire, Hôpital de Hautepierre, 1 avenue Molière, Strasbourg 67098, France

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### Abstract

The use of iterative algorithms in tomographic reconstruction always leads to a frequency adapted rate of convergence in that low frequencies are accurately reconstructed after a few iterations, while high frequencies sometimes require many more computations. In this paper, we propose to build *frequency adapted* (FA) algorithms based on a condition of incomplete backprojection and propose an FA *simultaneous algebraic reconstruction technique* (FA-SART) algorithm as an example. The results obtained with the FA-SART algorithm demonstrate a very fast convergence on a highly detailed phantom when compared to the original SART algorithm. Though the use of such an FA algorithm may seem difficult, we specify in which case it is relevant and propose several ways to improve the reconstruction process with FA algorithms.

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