

**X-RAYS FLUORESCENCE COMPUTED TOMOGRAPHY :
ANALYTIC INVERSION AND ITERATIVE METHODS**

Alvaro R. De Pierro *

**Institute of Mathematics and Computer Sciences (ICMC), University of
São Paulo, Brazil**

X-Rays Fluorescence Computed Tomography (XFCT) is a relatively new technique aiming at reconstructing the distribution of an element, usually a metal, inside a body. This is achieved by irradiating the object with high intensity X-rays at a given energy level. This induces emission radiation by the element, that is counted by an outside detector. The model for the problem is the Generalized Attenuated Radon Transform (GART), the operator to be inverted. We present recent developments for the inversion of GART : an analytic formula [1], iterative methods based on Radon inversion [2] as well as others that consider the Poisson nature of the noise [3].

References

[1] Miqueles and A.R. De Pierro, "On the analytic inversion of the Generalized Attenuated Radon Transform for X-ray Fluorescence Computed Tomography", Studies in Applied Mathematics, Volume 127, 4, p. 394-419, 2011.

[2] Miqueles and A.R. De Pierro, "Iterative Reconstruction in X-ray Fluorescence Tomography Based on Radon Inversion", IEEE Transactions on Medical Imaging, Volume 30, p. 438-450, 2011. .

[3] Miqueles and A.R. De Pierro, "Fast Continuous Iterative Methods in X-Rays Fluorescence Computed Tomography" , Journal of Physics : Conference Series, Volume 410 conference 1, 2014 .

0. * Supported by CNPq grant No 304820/2006-7, Brazil