1014-65-375 **Luisa D'Amore** (luisa.damore@dma.unina.it), Naples, Italy, **Serena Morigi** (morigi@dm.unibo.it), Bologna, Italy, **Almerico Murli** (almerico.murli@dma.unina.it), Naples, Italy, and **Fiorella Sgallari*** (sgallari@dm.unibo.it), Dept. Matematics-CIRAM, University of Bologna, Via Saragozza 8, 40123 Bologna, Italy. *Some computational issues on inverse problems in medical imaging.*

A general principle for dealing with the intrinsic numerical instability of most inverse problems is that of regularization. The milestone is the Tikhonov approach. About '90 Rudin, Osher & Fatemi introduced total variation regularization and Perona & Malik the scale-space concepts and the PDEs approaches for edge preserving denoising of images. A strong relation between regularization and scale-space approaches exists via the Euler-Lagrange equation for the regularization functional, which consists of a PDE of parabolic type. Since then, according to the features of the specific application, several functionals have been investigated in order to provide more reliable image and edges models.

Regularization approaches for solving inverse problems developed systematically, on the other hand in real applications many difficulties still arise, starting from the choice of suitable discretization schemes or the selection of the best solvers for the underlying computational kernels, until the software implementation.

In this talk we point out some computational issues concerning the numerical solution of inverse problems related to medical image denoising and segmentation. Numerical experiments on real cardiac 2D and 3D ultrasound image sequences will be shown. (Received September 13, 2005)