1056-35-1378 **Pierre Garapon*** (pgarapon@stanford.edu), Department of mathematics, Sloan Hall, 450 Serra Mall, Stanford, CA 94305, **Habib Ammari** (ammari@cmapx.polytechnique.fr), Ecole Polytechnique, 91128 Palaiseau, France, and **François Jouve** (jouve@math.jussieu.fr), Laboratoire Jacques Louis Lions, 175-179 rue du chevaleret, 75013 PARIS, France. *Multiscale elasticity imaging.*

Elasticity imaging or elastography is a new medical imaging modality. It consists of applying to an incompressible soft elastic medium a mechanical excitation and retrieving the resulting displacement field in order to assess the mechanical properties of the medium. We use the model of harmonic incompressible elasticity in a bounded inhomogenous medium to model the situation. Using the formalism of integral equations, we derive an asymptotic analysis of the displacement field in presence of a small inclusion. The multiscale behaviour that we observe for the field is our starting point to design a numerical technique to solve the inverse problem and image the elastic modulus of the medium. We discuss the performances of such a numerical technique. (Received September 21, 2009)