X-RAY TRANSFORM OF ANISOTROPIC MODELS FOR BONES

The aim of this study is to find a parameter, easily computable, to detect osteo-porosis from radiographic images. We consider two types of anisotropic models for bones: a Gaussian random field characterized by its spectral density on one side, a microball model characterized by the intensity of a Poisson measure on another side. This last one is obtained by throwing balls whose center and radius are given by a point Poisson process.

These models are anisotropic generalizations of the Fractional Brownian Motion (resp. the isotropic microball model). They are obtained through an anisotropic deformation of the spectral density (resp. intensity) of these two isotropic models. Moreover, classes of such fields are stable through X-ray transform.

In each case the anisotropy is given by a function of the direction, which one would like to recover from radiographs. Self-similarity properties seem appropriate tools for this, once one has performed an X-ray transform.