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Unité Mixte de Recherche 5259
Laboratoire de Mécanique des Contacts et des Structures

# Bone elasticity: 3D synchrotron imaging, multiscale modeling, and uncertainties

**Vittorio SANSALONE**

*Université Paris-Est, Laboratoire Modélisation et Simulation Multi Echelle, UMR CNRS 8208 MSME, France*

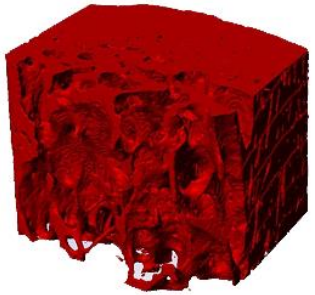

*Fig.1: 3D model of a bone sample obtained by SR-µCT*

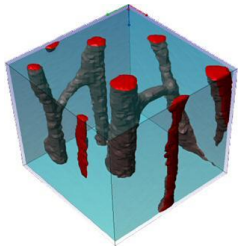

*Fig.2: Bone RVE (~500 µm)*

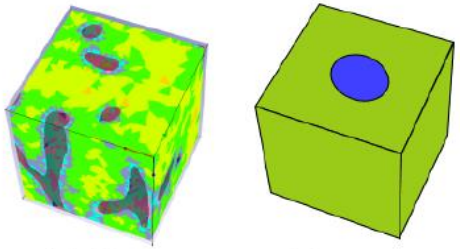


*Fig.3: Models of the RVE*

Bone is a biocomposite material whose mechanical properties are governed by the relative amount and hierarchical organization of its constituents (collagen, mineral and water) at micro- and nano-scale. Information on bone organization and composition can be obtained through several imaging techniques. Multiscale modeling and simulation based on high resolution imaging can be used to accurately estimate bone elastic properties.

In this talk, I will first review our results on this topic and discuss them with respect to some issues related to image treatment and modeling assumptions. Then, I will address the issue of uncertainty in the experimental data which can affect the reliability of model predictions.

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