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Yuliya Gorb* (gorb@math.uh.edu), Department of Mathematics, University of Houston,
Houston, TX 77204-3008. *Multiscale Modeling and Simulation of Fluid Flows in Deformable
Porous Media.*

The main focus of this study is on fluid flows in deformable elastic media and associated multiscale problems. Many upscaling methods are developed for flows in rigid porous media or deformable elastic media assuming infinitely small fluid-solid interface displacements relative to the pore size. Much research is needed for the most general and least studied problem of flow in deformable porous media when the fluid-solid interface deforms considerably at the pore level. In this talk, we introduce a general framework for numerical upscaling of the deformable porous media in the context of a multiscale finite element method. This method allows for large interface displacements and significant changes in pore geometry and volume. (Received September 21, 2011)