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Suncica Canic*, University of Houston, Department of Mathematics, 651 PGH, Houston, TX
77204. *Mathematical Methods in Cardiovascular Applications.*

Mathematical modeling, analysis and numerical simulation provide a powerful tool to study various aspects of cardiovascular treatment. This talk will address two examples: a mathematical study of fluid-structure interaction with a clinical application to 2D and 3D Doppler assessment of mitral regurgitation, and a novel multi-scale approach to modeling coronary stents as 3D meshes of 1D curved rods (3D network of 1D hyperbolic conservation laws). An overview of the basic mathematical ideas underlying this research and several applications to cardiovascular treatment will be presented. This talk will be accessible to a wide scientific audience. The work reported in this talk has been performed together with medical collaborators Dr. W. Zoghbi, Dr. S. Little and Dr. D. Paniagua of the Texas Medical Center in Houston and with mathematicians Prof. J. Tambaca (University of Zagreb, CRO), Prof. R. Glowinski, Prof. G. Guidoboni, post-doc A. Quaini, and graduate students M. Bukac, M. Kosor and T.B. Kim (UH). (Received September 13, 2010)