1067-35-667 **Giovanna Guidoboni*** (gguidobo@math.iupui.edu), 402 N. Blackford St., LD270, Indianapolis, IN 46202-3267. *Arterial blood flow modeling.*

We will present some new ideas related to the mathematical and numerical modeling of arterial blood flow. We will discuss the derivation of simplified closed effective models and the design of stable loosely-coupled numerical algorithms. 1) Standard one-dimensional models are obtained by averaging on the vessel cross-section, under the assumptions of cylindrical geometry and axially symmetric-flows. One-dimensional models are not closed: an ad hoc velocity profile needs to be prescribed to obtain a closed system. In this talk we will present a different approach based on multi-scale analysis which leads to reduced effective models that do not need any ad hoc closure assumption. 2) Loosely-coupled algorithms are based on the idea of splitting the original problem in a sequence of simpler sub-problems. Stability of loosely-coupled schemes is a critical issue in blood flow applications due to highly nonlinear interfacial coupling effects. In this talk, we will present a new type of loosely-coupled algorithm which does not suffer from the interfacial instabilities. The algorithm has been named kinematically-coupled scheme because of the crucial role played by the kinematic condition at the fluid-solid interface. (Received September 13, 2010)