Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

One dimensional modeling of blood flow in large networks XIAOFEI WANG, Institut Jean le Rond d'Alembert UPMC (Univ. Paris 6), PIERRE-YVES LAGREE, Institut Jean le Rond d'Alembert CNRS, JOSE-MARIA FULLANA, Institut Jean le Rond d'Alembert UPMC (Univ. Paris 6), SYLVIE LORTHOIS, Institut de Mecanique des Fluides de Toulouse, CNRS, INSTITUT DE MECANIQUE DES FLUIDES DE TOULOUSE COLLABORATION — A fast and valid simulation of blood flow in large networks of vessels can be achieved with a one-dimensional viscoelastic model. In this paper, we developed a parallel code with this model and computed several networks: a circle of arteries, a human systemic network with 55 arteries and a vascular network of mouse kidney with more than one thousand segments. The numerical results were verified and the speedup of parallel computing was tested on multi-core computers. The evolution of pressure distributions in all the networks were visualized and we can see clearly the propagation patterns of the waves. This provides us a convenient tool to simulate blood flow in networks.

Xiaofei Wang
Institut Jean le Rond d'Alembert

Date submitted: 23 Jul 2014 Electronic form version 1.4