Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

**Computational models for fluid-structure interaction with a poroelastic structure** RANA ZAKERZADEH, PAOLO ZUNINO, Department of Mechanical Engineering and Materials Science,University of Pittsburgh, MARTINA BUKAC, IVAN YOTOV, Department of Mathematics ,University of Pittsburgh — In the context of hemodynamics, we model blood flow in arteries as an incompressible Newtonian fluid confined by a multilayered poroelastic wall. We consider a two layer model for the arterial wall, where the inner layers behave as a thin structure modeled as a linearly elastic membrane, while the outer part of the artery is described by the Biot model. We propose and analyze a splitting strategy, which allows solving the Navier-Stokes and Biot equations separately. In this way, we uncouple the original problem into two parts defined on separate subregions, leading to a more efficient calculation of the numerical solution. The theoretical results will be complemented by numerical simulations. We numerically investigate the effects of porosity to the structure displacement. Namely, we distinguish a high storativity and a high permeability case in the Darcy equations, and compare them to the results obtained using a purely elastic model. A physical interpretation of the observed phenomena will be discussed. Indeed, the role of the proroelastic parameters on the pressure wave propagation in arteries emerges from the analysis of an equivalent formulation of the Biot system, where all the equations are condensed into a single one.

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Date submitted: 01 Aug 2013 Electronic form version 1.4