DIRECT AND INVERSE METHODS FOR CARDIOVASCULAR AND PULMONARY BIOMECHANICS

TRACK NUMBER (400)

MAREK BEHR[*], C. ALBERTO FIGUEROA[†], AND WOLFGANG A. WALL[‡]

[*] RWTH Aachen University
52056 Aachen, Germany
behr@cats.rwth-aachen.de http://www.cats.rwth-aachen.de

[†] University of Michigan
Ann Arbor, MI 48105, USA
alberto.figueroa@med.umich.edu http://bloodflow.engin.umich.edu

[‡] Technical University of Munich
85747 Garching b. München, Germany
wall@lnm.mw.tum.de http://www.lnm.mw.tum.de/en/staff/wall

Key words: Biomechanics, Inverse Methods, Coupled Problems, Reduced Order & System Level Modeling.

ABSTRACT

This mini-symposium aims to bring together computer modeling experts in the fields of cardiovascular and pulmonary biomechanics. Both theoretical and applied work will be showcased. Our goal is to provide a forum for discussion and exchange of ideas that will lead to the development of more realistic physical and physiological models, and their inclusion in large-scale simulations.

Topics include – but are not limited to – computational methods and models for:

- Fluid-structure interaction in cardiovascular and respiratory mechanics
- Computational methods for medical device modeling and performance evaluation
- Parameter estimation and inverse problems in cardiovascular mechanics
- Computer methods for disease research and surgical planning
- Cardiovascular tissue growth and remodeling
- Flow-induced physiological changes in blood - hemolysis, thrombosis, cell adhesion
- Flow and transport in tissues and scaffolds
- System level modeling techniques for cardiovascular and pulmonary circulation
- Flow and transport in lungs
- Data-driven and machine learning techniques in computational biomedical engineering
- Uncertainty quantification for complex problems in biomechanics