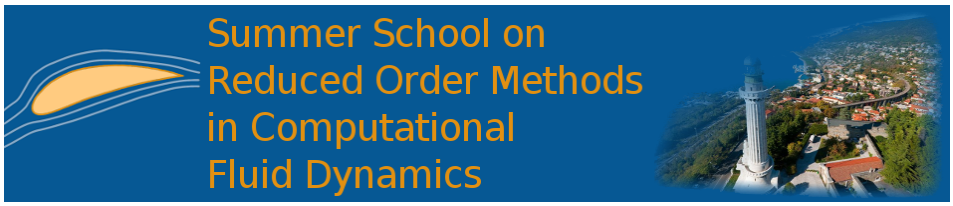

Contribution ID: **66** Type: **Poster**

Reduced order methods for parametric optimal flow control in patient-specific coronary bypass grafts: geometrical reconstruction, data assimilation

Wednesday, July 10, 2019 4:48 PM (3 minutes)

In this work, we will present implementation of reduced order methods for parametrized problems in computational fluid dynamics, with a special attention to inverse problems, such as optimal flow control problems and data assimilation in biomedical sciences.

Our focus will, specifically, be on minimizing the misfit between clinical measurements acquired in coronary artery bypass graft surgery and the related variables recovered through computational fluid dynamics. In this framework, the unknown control provides an opportunity to quantify the boundary conditions in computational hemodynamics modeling, specifically for hard-to-quantify outflow conditions. Furthermore, in this work, we adjoin the parametrized optimal flow control paradigm with reduced order methods (ROMs), such as proper orthogonal decomposition (POD)-Galerkin, to solve such many-query parameter dependent problems in a time-efficient manner.

Primary author: Ms ZAINIB, Zakia (mathLab, Mathematics Area, SISSA International School for Advanced Studies, Trieste, Italy)

Co-authors: Dr BALLARIN, Francesco (mathLab, Mathematics Area, SISSA International School for Advanced Studies, Trieste, Italy); Prof. ROZZA, Gianluigi (mathLab, Mathematics Area, SISSA International School for Advanced Studies, Trieste, Italy); Prof. TRIVERIO, Piero (University of Toronto, Toronto, Canada); Dr JIMÉNEZ-JUAN, Laura (Sunnybrook Health Sciences Centre, Toronto, Canada)

Presenter: Ms ZAINIB, Zakia (mathLab, Mathematics Area, SISSA International School for Advanced Studies, Trieste, Italy)

Session Classification: Poster blitz