Title of the talk: Variational Multiscale Finite Element Method for Cardiovascular Flows in Complex Arterial Domains

Abstract

This talk presents an overview of the finite element method, a numerical method for solving differential equations, followed by the introduction of an advanced stabilization technique, namely the variational multiscale finite element method (VMS-FEM). A stabilized numerical scheme is derived for the solution of the steady incompressible Navier–Stokes equations. The proposed formulation is implemented to investigate two-dimensional fluid flow in idealized arterial geometries, including diseased artery and aorta models. The results demonstrate the effectiveness of the VMS-FEM in capturing flow characteristics in complex domains.