Mathematical Methods and Models in Biosciences
June 15–20, 2025, Sofia, Bulgaria
https://biomath.math.bas.bg/biomath/index.php/bmcs

Mathematical analysis of coupled one-dimensional blood flow in an artery

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First-order hyperbolic systems are commonly used to model blood flow in arterial networks. These networks are composed of interconnected segments, or edges, which are coupled at junctions referred to as nodes. At these nodes, half-Riemann problems are solved to ensure the well-posedness of the overall system. This presentation will discuss both the theoretical framework and numerical simulations of these systems, emphasizing the role of appropriate boundary conditions at the network nodes. Computational results will be presented to illustrate key dynamical features of the flow.