Abstract Submitted
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A two-dimensional blood flow model with arbitrary cross sections.[1] CESAR A. ROSALES-ALCANTAR, GERARDO HERNANDEZ-DUENAS, National Autonomous University of Mexico — A two-dimensional model for blood flows with arbitrary cross sections will be presented. The model consists of a hyperbolic system of balance laws for conservation of mass and balance of momentum in the axial and angular directions. The main properties of the system will be discussed and a well-balanced central-upwind scheme will be presented. Important features of the model are inherited at the discrete level by the numerical scheme. For instance, the model is equipped with an entropy function and an entropy inequality that can help us choose the physically relevant weak solutions, and a large class of semi-discrete entropy-satisfying numerical schemes will be described. The merits of the scheme will be tested in a variety of scenarios with applications to problems such as stenoses and aneurysms. In particular, numerical results of a simulation using an idealized aorta model will be shown.

[1]Conacyt A1-S-17634 UNAM-DGAPA-PAPIIT IN113019

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