Influence of non-Newtonian blood flow models on drug deposition in the arterial wall

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Abstract. In this talk, we investigate the influence of non-Newtonian blood flow models on drug diffusion from a coronary drug-eluting-stent (DES). We consider the Oldroyd-B, Phan-Thien-Tanner (PTT) and Giesekus viscoelastic models for the description of fluid dynamics of blood. The model for blood flow is coupled with plasma filtration and mass transport from a DES. The model for the transport problem takes into consideration non-Fickian diffusion, drug dissolution, polymer degradation and binding. We propose an Implicit-Explicit (IMEX) finite element method and show numerical experiments that confirm the effectiveness and order of convergence of the employed methodology.