

NON-FICKIAN MODELS FOR BIODEGRADABLE DRUG ELUTING STENTS

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Resumo: In recent years, mathematical modeling of cardiovascular drug delivery systems has become an effective tool to gain deeper insights in the cardiovascular diseases like atherosclerosis. In the case of coronary biodegradable stent which is a tiny expandable biocompatible metallic mesh tube covered by biodegradable polymer, it leads to a deeper understanding of the drug release mechanisms from polymeric stent into the arterial wall. A coupled non-Fickian model of a cardiovascular drug delivery system using a biodegradable drug eluting stent is proposed in this talk. Energy estimates are used to study the qualitative behavior of the model. The numerical results are obtained using an IMEX finite element method. The influence of arterial stiffness in the sorption of drug eluted from the stent is analyzed. The results presented in this talk open new perspectives to adapt the drug delivery profile to the needs of the patient.

palavras-chave: Análise numérica; métodos numéricos em equações com derivadas parciais.