Optimal control analysis of a leukemia model under imatinib treatment
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Abstract
The paper is devoted to the study of a mathematical model of drug therapy for Chronic Myelogenous Leukemia (CML). The disease dynamics is given by a couple of delay differential equations that describe the interaction between a stem-like population of CML cells and a more mature, differentiated one, without self-renewal properties. A molecular targeted therapy, such as Imatinib, is considered. The objective is to minimize the size of the tumoral cells’ mass while minimizing the amount of drug (thus, minimizing both the adverse effects and the costs). The optimal control is calculated using a discretization scheme. The results are exemplified by numerical simulations.