



Differential Game of Pursuit Modelled by Infinite Three-Coupled System of Ordinary Differential Equations with Integral Constraints

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Abstract

This study examines a pursuit differential game of one pursuing player and one evading player modelled by an infinite three-coupled system of first-order ordinary differential equations. The control functions of the players adhere to integral constraints whereby the pursuing player has more control resources than the evading player. If, at some finite time, the pursuing player can drive the system's state from the initial state ξ^0 into the origin of the ℓ_2 space, the pursuit is then said to be completed. The evading player, however, aims to avert this from happening. We construct a control function and an admissible strategy for the pursuing player to solve the control problem and the differential game problem respectively. We give sufficient conditions for the pursuit to be completed in the game. In addition, we provide a concrete example to illustrate the application of our findings.

Keywords: admissible strategy; control problem; three-coupled; infinite system; integral constraint; pursuit differential game.