

Construction of strategies of pursuers in a differential game of many players with state and integral constraints

ABSTRACT

The approach of a group of controlled objects, the pursuers, to another one, the evaders, is considered. The motions of all the objects are described by simple differential equations. The control functions of players are subjected to integral constraints. The amount of control resources such as fuel, energy etc. are described by such constraints. Given a non-empty convex subset of R^n all objects move in this set. If the position of each evader y_j , $j \in \{1, 2, \dots, k\}$, coincides with the position of a pursuer x_i , $i \in \{1, \dots, m\}$, at some time t_j , i.e. $x_i(t_j) = y_j(t_j)$, then we say that pursuit can be completed. The total resource of the pursuers is assumed to be greater than that of the evaders. We show that pursuit can be completed in this differential game.

Keyword: Differential game; Controlled objects; Integral constraints; Differential equations