Solution of a linear pursuit-evasion game with integral constraints.

ABSTRACT

A linear two player zero-sum pursuit-evasion differential game is considered. The control functions of players are subject to integral constraints. In the game, the first player, the Pursuer, tries to force the state of the system towards the origin, while the aim of the second player, the Evader, is the opposite. We construct the optimal strategies of the players when the control resource of the Pursuer is greater than that of the Evader. The case where the control resources of the Pursuer are less than or equal to that of the Evader is studied to prove the main theorem. For this case a new method for solving of the evasion problem is proposed. We assume that the instantaneous control employed by the Evader is known to the Pursuer. For construction, the strategy of the Evader information about the state of the system and the control resources of the players is used.

Keyword: Differential game; Control; Strategy; Optimal time.