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GAME PROBLEMS OF APPROACH FOR QUASILINEAR SYSTEMS OF GENERAL FORM

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We study a conflict-controlled process of the approach of a trajectory to a cylindrical terminal set. The problem statement encompasses a wide range of quasilinear functional–differential systems. We use the technique of set-valued mappings and their selections to derive sufficient conditions for the game termination in a finite time. The methodology used is close to the scheme that involves the time of the first absorption. By way of illustration, quasilinear integro-differential games are examined. For this purpose, their solutions are presented in the form of an analog of the Cauchy formula. The calculations are performed for the case of a system with a simple matrix; the control sets of the players are balls centered at the origin and the terminal set is a linear subspace. Depending on the relations between the initial state of the system and the parameters of the process, sufficient conditions for the game termination are derived. An explicit form of the guaranteed time is found in one specific case.

Keywords: conflict-controlled process, selection of a set-valued mapping, Aumann’s integral, support function, integro-differential equation.

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