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The problem of evasion under interaction of groups of linear objects. (English. Russian original)

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Summary: The global evasion problem in two-person differential games was first posed and solved in the linear case by L. S. Pontryagin and E. F. Mishchenko (1971). The methodology proposed there was developed subsequently by L. S. Pontryagin. Methods of studying nonlinear systems were presented in the sequel, where game evasion problems were studied for groups of pursuers. The original method of solution of the latter problem was presented by F. L. Chernous'ko (1976), and the idea was essentially developed by A. A. Chikrij and E. V. Gubarev (1992). The local evasion problem on a finite time interval was considered by N. N. Krasovskij and A. I. Subbotin (1974).

In this note, we consider the problem of at least one of m evaders escaping from n pursuers in k -dimensional Euclidean space. Depending on the values of n , m , and k , we draw conclusions concerning the solvability of the global evasion problem. Moreover, all of the objects are of the same type, and their dynamics are linear.

MSC:

91A24 Positional games (pursuit and evasion, etc.)

91A23 Differential games (aspects of game theory)

Keywords:

many evaders; many pursuers; linear dynamics; solvability; global evasion problem