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On a Problem of Impulse Control under Disturbance and Possible Breakdown

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Abstract—We consider a linear problem with impulse control under an uncontrolled disturbance. The only information available about the disturbance is a connected compact set of its possible values. It is believed that one breakdown may occur and lead to a change in the dynamics of the control process. The time of the breakdown is not known in advance. Only the length of a time interval required to eliminate the breakdown is known. The goal of the control process is to ensure that the value of a linear function of the phase coordinates at a fixed point in time belongs to a given closed interval. The control is constructed based on the principle of minimization of the guaranteed result. The opponents are the disturbance and the time of the breakdown. Sufficient conditions are found under which the problem has a solution. A guaranteeing control is constructed.

Keywords: control, impulse control, disturbance, breakdown.

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