

**ASYMPTOTICS OF THE OPTIMAL TIME IN A TIME-OPTIMAL CONTROL
PROBLEM WITH A SMALL PARAMETER**

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A time-optimal control problem for a singularly perturbed linear autonomous system is considered. The main difference of this case from systems with fast and slow variables studied earlier is that the eigenvalues of the matrix at the fast variables do not satisfy the standard requirement of the negativity of the real part. We obtain and justify a complete power asymptotic expansion in the sense of Erdelyi of the optimal time and optimal control with respect to the small parameter at derivatives in the equations of the system.

Keywords: optimal control, time-optimal control problem, asymptotic expansion, singularly perturbed problems, small parameter.

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