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Asymptotic solution of a singularly perturbed optimal problem with integral constraint.

Summary: Using the so-called direct scheme method, an asymptotic expansion of $n$-th order to the solution of a class of singularly perturbed linear-quadratic optimal problem with integral constraint on control is constructed. The expansion contains three type functions. Two of them are boundary layer functions in the vicinities of two fixed end-points, and the remain is regular function. A numerical example is represented to illustrate the obtained results.

MSC:

49N10 Linear-quadratic optimal control problems
49K15 Optimality conditions for problems involving ordinary differential equations
49J21 Existence theories for optimal control problems involving relations other than differential equations
34E05 Asymptotic expansions of solutions to ordinary differential equations
34E10 Perturbations, asymptotics of solutions to ordinary differential equations

Keywords:

singular perturbation; optimal control; asymptotic approximation; direct scheme method; integral constraint

Full Text: DOI

References:

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