

论文与报告

## LQ控制区段混合能矩阵的微分方程及其应用

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摘要

本文根据计算结构力学与线性二次控制的对应关系, 提出了连续时间有限区段的混合能分块子矩阵 $Q_2$ ,  $G_2$ 及 $\Phi_2$ . 推导出适用于LQ控制非定常课题的二区段连接的凝聚消元公式及这些子矩阵的微分方程, 可用级数展开求解这些方程. 当 $\Delta t$ 很小时, 这些分块子矩阵的高次近似可以大大加速里卡提代数方程算法的收敛性.

关键词 [区段混合能矩阵](#) [LQ控制](#)

分类号

## On Differential Equation of the Interval Mixed Energy Submatrices of LQ Control and its Application

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Abstract

Based on the corresponding relation between LQ control and computational structural mechanics, the interval mixed energy matrices  $Q_2$ ,  $G_2$  and  $\Phi_2$  are put forward in this paper. Then, the formulas for the condensation algorithm of the LQ control problem are derived. From the condensation formulas, the differential equations for these matrices are introduced. The Riccati equation is one of them. These equations are solved by the series expansion method when  $\Delta t$  is very small. Using the higher approximation of the very small interval,  $\Delta t$ , one can speed up the iterative solution of the algebraic Riccati equation.

Key words [Interval mixed energy submatrices](#) [LQ control](#)

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