

Elliptic Regularization for the Semi-linear Telegraph System

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Abstract

We associate two-point boundary conditions to an elliptic regularization of the semi-linear telegraph system. By using the boundary function method due to Vishik and Lyusternik, we compare the solutions of the perturbed and unperturbed systems, and find the order of approximation in different spaces of functions. The problem is singularly perturbed of elliptic-hyperbolic type, and we need the high regularity with respect to t of the solutions to both problems for this analysis.

Keywords and phrases. Asymptotic approximation, boundary function method, elliptic regularization, telegraph system.

2000 AMS Subject Classification. Primary 35B25, 35J65; Secondary 35L45, 35L50, 41A60.