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Stabilization of the wave equation with moving boundary

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Abstract

We deal with the wave equation with assigned moving boundary ($0 < x < a(t)$) upon which Dirichlet-Neuman boundary conditions are satisfied, here $a(t)$ is assumed to move slower than light and periodically. We give a feedback which guarantees the exponential decay of the energy. The proof relies on a reduction theorem by Yoccoz [1, 2]. At the end we give a remark on the moving-pointwise stabilization problem.

Keywords: Strings with moving ends, stabilization, rotation number

2010 MSC: 35L05, 34K35, 93B07, 95B05.

1. Introduction and main result

In this paper, we analyze the stabilization property of solutions for the wave equation with a moving boundary. The mechanism of the problem was discovered by Dittrich, Duclos and Gonzalez [3] where they used a direct estimates

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