

## GLOBAL EXISTENCE AND DECAY OF SOLUTIONS OF A SINGULAR NONLOCAL VISCOELASTIC SYSTEM WITH DAMPING TERMS

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*In memory of the second author's father  
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(1910–1999)*

ABSTRACT. In this paper, a singular one-dimensional viscoelastic system with a nonlinear source term, nonlocal boundary condition and damping terms is considered. We prove the existence of a global solution using the potential-well theory. Furthermore, by constructing Lyapunov functional combined with the perturbed energy method, the general decay result is proved.

### 1. Introduction

Over the past 40 years, the evolution problem with integral conditions have been carefully investigated. It has been implemented by Canon and its team. These problems may be addressed within many scientific fields and many engineering models and applied extensively in heat transmission theory, medical science, biological processes, chemical engineering, chemical reaction, plasma physics, thermal conductivity, dynamics Population, biological processes, thermal temperature, and control theory. See the works ([2]–[5], [8], [10], [13], [12] and [21]). Most research has been devoted to nonlocal mixed problems of classical

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