

On a Kirchhoff diffusion equation with integral condition

Danh Hua Quoc Nam

Division of Applied Mathematics, Thu Dau Mot University, Binh Duong Province, Vietnam
namdhq@tdmu.edu.vn

Abstract

This paper is devoted to Kirchhoff-type parabolic problems with the nonlocal integral condition. Our problem has many applications in physical and biological phenomena. The first part of our paper concerns the local existence of the mild solution in Hilbert scales. Our results can be studied into two cases: homogeneous case and inhomogeneous case. In order to overcome difficult things, we applied Banach fixed point theorems and some new techniques on Sobolev spaces. The second part of the paper is to derive the ill-posedness of the mild solution in the sense of Hadamard.

Keywords: Kirchhoff-type problems, Nonlocal problem, Well-posedness, Regularization