WEIGHTED FOURTH ORDER EQUATION
OF KIRCHHOFF TYPE IN DIMENSION 4
WITH NON-LINEAR EXPONENTIAL GROWTH

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ABSTRACT. In this work, we are concerned with the existence of a ground
state solution for a Kirchhoff weighted problem under boundary Dirichlet
condition in the unit ball of $\mathbb{R}^4$. The nonlinearities have critical growth
in view of Adams' inequalities. To prove the existence result, we use Pass
Mountain Theorem. The main difficulty is the loss of compactness due to
the critical exponential growth of the nonlinear term f. The associated
energy function does not satisfy the condition of compactness. We provide
a new condition for growth and we stress its importance to check the min-
max compactness level.

1. Introduction

In this paper, we consider the non local fourth order elliptic equation:

$$(1.1) \quad \begin{cases} g\bigg(\displaystyle\int_B (w(x)|\Delta u|^2 + |\nabla u|^2 + V(x)u^2)\, dx \bigg) \\ \qquad\qquad \times \big[\Delta(w(x)\Delta u) - \Delta u + V(x)u \big] = f(x,u) & \text{in } B, \\ u = \dfrac{\partial u}{\partial n} = 0 & \text{on } \partial B, \end{cases}$$