

ON THE EXTREMAL PARAMETERS OF A SUBCRITICAL KIRCHHOFF TYPE EQUATION AND ITS APPLICATIONS

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We study a superlinear and subcritical Kirchhoff type equation which is variational and depends upon a real parameter λ . The nonlocal term forces some of the fiber maps associated with the energy functional to have two critical points. This suggests multiplicity of solutions and indeed we show the existence of a local minimum and a mountain pass type solution. We characterize the first parameter λ_0^* for which the local minimum has non-negative energy. Moreover we characterize the extremal parameter λ^* for which if $\lambda > \lambda^*$, then the only solution to the Kirchhoff equation is the zero function. In fact, λ^* can be characterized in terms of the best constant of Sobolev embeddings. We also study the asymptotic behavior of the solutions when $\lambda \downarrow 0$.