

# General decay and blow up of solutions for a variable-exponent viscoelastic double-Kirchhoff type wave equation with nonlocal degenerate damping

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## Abstract

In this paper we consider a viscoelastic double-Kirchhoff type wave equation of the form  $u_{tt} - M_1(\|\nabla u\|^2) \Delta u - M_2(\|\nabla u\|_{p(x)}) \Delta_{p(x)} u + (g \ast \Delta u)(x, t) + \sigma(\|\nabla u\|^2) h(u_t) = \phi(u)$ , where the functions  $M_1, M_2$  and  $\sigma, \phi$  are real valued functions and  $(g \ast \nabla u)(x, t)$  is the viscoelastic term which are introduced later. Under appropriate conditions for the data and exponents, the general decay result and blow-up of solutions are proved with positive initial energy. This study extends and improves the previous results in the literature to viscoelastic double-Kirchhoff type equation with degenerate nonlocal damping and variable-exponent nonlinearities.

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