Pei Pei* (ppei@otterbein.edu), Mohammad Rammaha and Daniel Toundykov. Weak solutions and blow-up for wave equations of p-Laplacian type with supercritical sources.

This paper investigates a quasilinear wave equation with Kelvin-Voigt damping, \( u_{tt} - \Delta_p u - \Delta u_t = f(u) \), in a bounded domain \( \Omega \subset \mathbb{R}^3 \) and subject to Dirichlet boundary conditions. The operator \( \Delta_p, 2 < p < 3 \), denotes the classical p-Laplacian. The nonlinear term \( f(u) \) is a source feedback that is allowed to have a supercritical exponent, in the sense that the associated Nemytskii operator is not locally Lipschitz from \( W^{1,p}_0(\Omega) \) into \( L^2(\Omega) \). Under suitable assumptions on the parameters, we prove existence of local weak solutions, which can be extended globally provided the damping term dominates the source in an appropriate sense. Moreover, a blow-up result is proved for solutions with negative initial total energy. This is joint work with Dr. Mohammad A. Rammaha and Dr. Daniel Toundykov. (Received September 03, 2016)