1000-35-64 **Petronela Radu*** (`pradu@math.unl.edu`), Department of Mathematics, 203 Avery Hall, University of Nebraska, Lincoln, NE 68588. *Weak solutions for semilinear wave equations with damping and source terms.*

Over the past decade there has been significant progress in the study of the existence of weak solutions to semilinear wave equations with power-like damping and source terms. We present an existence theorem that brings improvements to recent work by J. Serrin, G. Todorova and E. Vitillaro, by allowing more general nonlinearities. We study an initial value problem over the entire space for the equation:

$$u_{tt} - \Delta u + f(x, t, u) + g(x, t, u_t) = 0,$$

where each of the functions f and g is bounded in the third argument by a polynomial, and g is increasing in the last argument. The potential well technique due to L. E. Payne and D. H. Sattinger and a monotonicity argument due to J. L. Lions and W. Strauss are the main tools used. (Received August 10, 2004)