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**Petronela Radu\*** (pradu@math.unl.edu). *Existence issues for semilinear wave equations.*

The importance of showing existence, uniqueness or blow up of weak solutions to semilinear wave equations is not merely of a theoretical nature, as such partial differential equations appear in the theory of relativity, or they can model the motion of a membrane with a resistance force proportional to the velocity. The presence of a source term (a nonlinearity that depends on the displacement  $u$ ) in such an equation can lead to blow up of solutions, so one can hope only for a local in time result under general assumptions. The problem becomes more difficult when we have a source term (referred to as the bad term) and a dissipative term (the good term), since we have to pass to the limit simultaneously in our sequence of approximations in two nonlinearities. I will present some new results showing how one can overcome the difficulty by using Sattinger's potential methods and the celebrated Lions-Strauss monotonicity argument. (Received August 30, 2005)