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Michael Neilan* (neilan@math.utk.edu), Department of Mathematics, 121 Ayres Hall, 1403 Circle Dr., Knoxville, TN 37996. *Finite element approximations of fully nonlinear second order PDEs.*

This talk concerns with numerical approximations of solutions of fully nonlinear second order partial differential equations. A new notion of weak solutions, called moment solutions, is introduced, which unlike viscosity solutions, are defined by a constructive method called the vanishing moment method. As an example, we focus on the Monge-Ampère equation, and introduce conforming C^1 finite element methods, mixed finite element methods, and nonconforming finite elements for this problem based on the vanishing moment method. We then show convergence results and computational examples. (Received August 31, 2008)