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Gerard Awanou*, NIU/Mathematical Sciences, Dekalb, IL 60115. *Numerical methods for fully nonlinear elliptic equations*. Preliminary report.

While the theory of second order fully nonlinear equations has received considerable attention, there is a paucity of numerical methods, especially finite element methods, for these equations. As it is not in general possible to weaken the order of the equations through integration by parts, spaces of C^1 spline functions form an appropriate framework to approximate the solution of these equations. We introduce a general framework for numerical solution of these equations and illustrate the performance of the approach with numerical experiments using the spline element method. We treat the examples of the Monge-Ampère and Pucci equations and discuss the convergence of our algorithms. (Received February 15, 2010)