1046-00-1650   **Xiaomei Ji*** (`xji@ams.sunysb.edu`), Dept. of Applied Mathematics & Statistics, Stony Brook University, Stony Brook, NY 11794-3600. *An optimal order error estimate of a linear finite element method for smooth solutions of 2D systems of conservation laws.*

We consider approximating smooth solutions of systems of nonlinear conservation laws by a linear finite element method with uniform mesh in two spatial dimensions, where the time discretization is carried out by a second order explicit Runge-Kutta method. An optimal error estimate $O(h^2)$ in L^2-norm for continuous linear finite elements is obtained under the CFL condition $\Delta t \leq Ch^{\frac{4}{3}}$, where h and Δt are the spatial meshsize and the time step, respectively, and the positive constant C is independent of h and Δt. (Received September 16, 2008)