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Kening Wang* (kening.wang@unf.edu), 1 UNF Drive, Department of Mathematics and Statistics, University of North Florida, Jacksonville, FL 32224, and **Shuang Li** (ben.shuangli@gmail.com), Derivative Valuation Center, Ernst & Young LLP, New York City, NY 10036. *L_q error estimates and superconvergence analysis for finite element methods for compressible miscible displacement.*

We investigate the finite element methods for a nonlinear parabolic system describing compressible miscible displacement in porous media. By introducing nonstandard elliptic projections and the new technique of approximating initial conditions, optimal order estimates in $L_q(\Omega)$ for $2 \leq q \leq \infty$ are obtained, where Ω is a bounded domain in \mathcal{R}^2 . Moreover, superconvergence results for the error between the approximate solution and the elliptic projection of the exact solution in $W^{1,q}(\Omega)$ for $2 \leq q \leq \infty$ are also demonstrated. (Received September 22, 2010)