1057-65-392   **Jay Gopalakrishnan*** (`jayg@ufl.edu`), 358 Little Hall, PO Box 118105, Gainesville, FL 32611-8105, and **Johnny Guzman**, Gainesville. *Two new families of mixed finite elements for elasticity.*

By using a characterization of divergence free tensors with vanishing normal components, using a new matrix bubble, we develop two families of finite elements for elasticity. We consider the mixed Hellinger-Reissner formulation, where symmetry is imposed weakly. Optimal error estimates can be obtained for stress, displacement, and rotation variables in each case. We compare with a few other known elements. Finally we discuss a few surprising cases of special meshes where weak symmetry imply exact symmetry. (Received January 26, 2010)

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