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**Michael Neilan\*** ([neilan@pitt.edu](mailto:neilan@pitt.edu)), 636 Ravencrest Rd., Pittsburgh, PA 15215. *Conforming and Divergence Free Stokes Elements.*

We present a family of conforming finite elements for the Stokes problem on general triangular meshes in two dimensions. The lowest order case consists of enriched piecewise linear polynomials for the velocity and piecewise constant polynomials for the pressure. We show that the elements satisfy the inf-sup condition and converges optimally for both the velocity and pressure. Moreover, the pressure space is exactly the divergence of the corresponding space for the velocity. Therefore the discretely divergence free functions are divergence free pointwise. We also show how the proposed elements are related to a class of  $C^1$  elements through the use of a discrete de Rham complex. This is joint work with Johnny Guzman. (Received December 21, 2011)