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**Sean Ryan Breckling\*** ([sean.breckling@unlv.edu](mailto:sean.breckling@unlv.edu)), 4505 S. Maryland Pkwy., Las Vegas, NV 89154. *A Numerical study of the Navier Stokes- $\alpha$  Deconvolution Model with Pointwise Mass Conservation.*

This paper presents efficient, universally stable finite element schemes for the Navier Stokes- $\alpha$  (NS $\alpha$ ) deconvolution model in both two and three dimensions. The accuracy of these schemes is enhanced by van Cittert approximate deconvolution, as well as through the choice of pointwise divergence-free discrete spaces. Finite element analysis is provided, which includes results for stability and well-posedness, as well as optimal convergence results for both velocity and pressure. Finally, several numerical experiments are presented which demonstrate the performance of NS $\alpha$  against direct numerical simulations of the Navier-Stokes equations, as well as the advantages pointwise divergence-free finite elements. (Received September 16, 2016)