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John P Roop* (jproop@ncat.edu), Department of Mathematics, North Carolina A & T SU, 1601 E. Market St., Greensboro, NC 27410, **Traian Iliescu**, Department of Mathematics, Virginia Tech, McBryde Hall, Blacksburg, VA 24061, and **Zhu Wang**, Department of Mathematics, Virginia Tech, McBryde Hall, Blacksburg, VA 24061. *Variational Multiscale and SUPG Stabilization of Proper Orthogonal Decomposition Approximation for a Generalized Oseen Problem.*

The Proper Orthogonal Decomposition reduced-order modeling technique for the approximation of partial differential equations has several well-documented drawbacks. One of the drawbacks indicated is the numerical instability inherited in convection-dominated problems. In a recent paper, Iliescu and Wang analyzed the the numerical solution using POD for a convection-dominated convection diffusion problem, showing numerical estimates thereof. In this paper, we discuss the extension of this concept to a generalized Oseen problem. We derive numerical estimates for the POD solution, when applying both the variational multiscale (VMS) as well as the streamline upwind Petrov-Galerkin (SUPG) stabilization technique to the reduced-order variational problem. (Received September 22, 2011)