1145-35-176   **Adam Larios**, 203 Avery Hall, Lincoln, NE 68588, **Yuan Pei*** (`yuan.pei@wwu.edu`), 516 High St., Bellingham, WA 98225, and **Leo Rebholz**, O-109 Martin Hall, Clemson University, Clemson, SC 29634. *On the velocity-vorticity-Voigt formulation of the 3D Navier-Stokes equations.* Preliminary report.

In this talk, we propose a new regularization of the 3D Navier-Stokes equations, which we call the 3D velocity-vorticity-Voigt (VVV) model, with a Voigt regularization term added to momentum equation in velocity-vorticity form, but with no regularizing term in the vorticity equation. We prove global well-posedness and regularity of this model along with an energy identity. We also show convergence of the model's velocity and vorticity to their counterparts in the 3D Navier-Stokes equations as the Voigt modeling parameter tends to zero. Further, we provide a criterion for finite-time blow-up of the 3D Navier-Stokes equations based on this inviscid regularization. This is joint work with Adam Larios and Leo Rebholz. (Received August 15, 2018)