1048-76-48 **Leo G Rebholz*** (rebholz@clemson.edu), Department of Mathematical Sciences, Clemson University, Clemson, SC 29634, and **Myron M Sussman**. *The NS-alpha-deconvolution turbulence model.* Preliminary report.

We study a high-order accurate generalization of the NS-alpha turbulence model, called the NS-alpha-deconvolution model. We show that by combining the alpha filter with van Cittert approximate deconvolution, the resulting model can retain the many attractive properties of NS-alpha while also achieving higher formal accuracy. We prove the new model admits unique weak solutions, conserves energy, helicity, and 2d enstrophy, is frame invariant, and can be solved with many less degrees of freedom than the NSE. We also study its limiting behavior, and present a numerical scheme and experiments that illustrate the advantages of the new model. (Received January 12, 2009)