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Ramjee P Sharma*, rsharma@math.okstate.edu, Atlanta, GA 30092, and **Jiahong Wu**, Stillwater, OK 74078. *New Numerical Results on the Surface Quasi-Geostrophic Equations*. Preliminary report.

The question whether classical solutions of the surface quasi-geostrophic (SQG) equation can develop finite-time singularities remains open. We present new numerical computations of the solutions to the SQG equation corresponding to several classes of initial data previously proposed by Constantin, Majda and Tabak. By parallelizing the serial pseudo-spectral codes through slab decompositions and applying suitable filters, we are able to simulate these solutions with great precision and on large time intervals. These computations reveal detailed finite-time behavior, large-time asymptotics and key parameter dependence of the solutions and provide information for further investigations on the global regularity issue concerning the SQG equation. (Received August 27, 2010)