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Gerhard Ströhmer* (strohmer@iowa.uiowa.edu), Department of Mathematics, 15 MacLean Hall, Iowa City, IA 52242. *About Rotating Configurations of Compressible Fluids under the Influence of their own Gravity.*

We discuss conditions for the existence and stability of a number of configurations of compressible fluids rotating like a rigid body. The fluid is assumed to be surrounded by a free surface without surface tension, which prevents some perturbations from decaying exponentially. This causes some difficulties in showing dynamic nonlinear stability even for configurations that are stable in the sense of being local minima of the energy. (Received January 25, 2011)