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Dynamic stabilization of the Rayleigh-Bénard instability in rectangular enclosures: A computational model[1] RANDY CARBO, Pennsylvania State University, ROBERT SMITH, MATT POESE, Applied Research Laboratory, Pennsylvania State University — If an acoustic field is imposed on a fluid within a container, the critical Rayleigh number is a strong function of the frequency and amplitude of that acoustic field as noted by G. Swift. and S. Backhaus, [*J. Acoust. Soc. Am.* **126**(5), 2009]. Results will be reported for nonlinear and linear models constructed to predict the modified critical Rayleigh number, based on a full field solution of the hydrodynamic equations using the approach of A. Yu. Gelfgat, [*J. Comp. Phys.* **156**, 1999]. The spatial portion of the differential equations were solved using the Galerkin method and the dynamic stability for the linear model was determined using Floquet analysis. One of the benefits of the approach compared to the averaging methods used by G. Gershuni and D. Lyubimov, *Thermal Vibration Convection*, (Wiley, New York, 1998) is that the parametric stability boundary can be recovered. This study includes a variety of container aspect ratios, boundary conditions, and Rayleigh numbers ranging from 10^3 to 10^8.

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Randy Carbo
Pennsylvania State University

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