Feedback Control of the Marangoni–Bénard Instability in a Fluid Layer with a Free-Slip Bottom

ABSTRACT

Feedback control was applied to the steady Marangoni–Bénard convection in a horizontal layer of fluid with a free-slip bottom heated from below and cooled from above. The critical values of the Marangoni numbers for the onset of steady convection are calculated and the latter is found to be critically dependent on the Crispation and Bond numbers. It is shown that the onset of instability can be delayed and the critical Marangoni number can be increased through the use of feedback control.