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On the thermal convection in a viscoelastic Jeffreys fluid layer heated from below confined between walls of finite thickness and thermal conductivity.[1] ILDEBRANDO PREZ-REYES, Universidad Autnoma de Chihuahua , REN O. VARGAS-AGUILAR, Instituto Politcnico Nacional — The thickness and thermal conductivity of the bounding walls are of interest in the hydrodynamic stability of a viscoelastic fluid layer. In this work the linear hydrodynamic stability is studied by means of the Galerkin method. The two ideal cases of thermal insulating and perfect thermal conducting walls are bridged by taking into account these two properties. Curves of criticality for the Rayleigh number, the wavenumber and the frequency of oscillation against the thermal conductivity for fixed wall thickness, Prandtl number and relaxation and retardation times are presented. Here, the dimensionless retardation time E was set to 0.05 and 0.1 while the dimensionless relaxation time F was set to 0.1 and 100. The role of the thermal conductivity and of the thickness of the walls are discussed. One important result of this investigation is that for non ideal thermal conducting conditions the system is more stable when the thickness of the fluid layer is larger in comparison to that of the boundaries. A discussion on the effect of E and F on the stability is given as well.

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