Effect of aspect ratio on the Rayleigh convection of Maxwell viscoelastic fluids in a cavity heated from below[1] ILDEBRANDO PEREZ-REYES, Universidad Autnoma de Chihuahua, ALEJANDRO SEBASTIAN ORTIZ-PEREZ, Universidad Autnoma de Baja California, NESTOR GUTIERREZ-MENDEZ, Universidad Autnoma de Chihuahua, FLUIDS, HEAT AND MASS TEAM — Interesting results, of the effect the parity of convective rolls, on the Rayleigh convection in a Maxwell viscoelastic fluid confined in a 2D cavity are presented. A linear stability analysis have shown how the fluid stability changes for different values of the aspect ratio ranging from 0.1 to 10. It was found that vertical and horizontal parity of the temperature and velocity solutions, related to parity of the number of rolls distributed horizontally or vertically, gives different stability scenarios. On the other hand, kinks also appear in the curves of criticallity, which is also found in the stability of newtonian fluids which also depend on the symmetry of the solutions. Results and physical mechanisms shall be presented in terms of plots of the critical Rayleigh number and the frequency of oscillation for different cases encompassing perfect thermal conducting, or insulating, lateral, or horizontal, walls. Different values of the dimensionless relaxation time F are considered to discuss the physical mechanism of instability for fixed values of the Prandtl number Pr as well.

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