Rencontre du non-linéaire 29-31 Mars 2022

Linear stability analysis of thermomagnetic convection in a ferrofluid under radial buoyancies.

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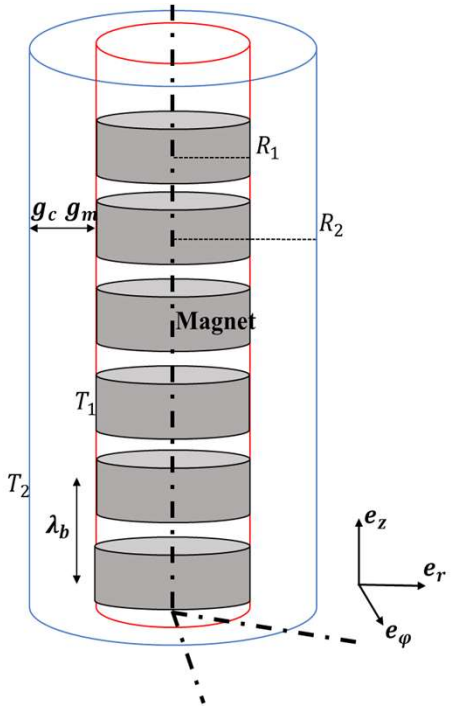
Flow configuration



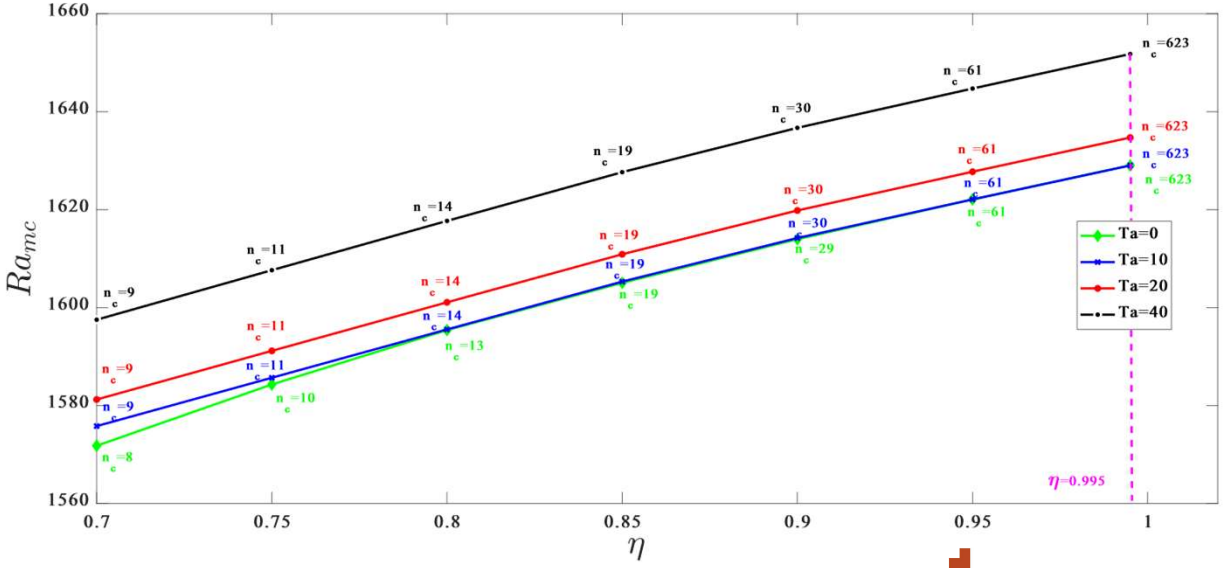
Problem formulation

$$\vec{\nabla}.\vec{v} = 0$$

$$\frac{d\vec{v}}{dt} + (\vec{v}.\vec{\nabla})\vec{v} = -\vec{\nabla}\pi + \Delta\vec{v} - Gr\theta\vec{e}_z - \frac{Ra_m}{Pr}\theta\frac{K_1(\kappa_b r)}{C_{Mag}}\vec{e}_r - \gamma_a\theta\frac{v^2}{r}\vec{e}_r$$

$$\frac{d\theta}{dt} + (\vec{v}.\vec{\nabla})\theta = \frac{1}{Pr}\Delta\theta$$

Threshold evolution in microgravity



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