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Effect of Curvature Parameter on Non-Darcy Mixed Convective Flow in a Vertical Annulus: A LTNE Approach MOUMITA BHOWMIK, PREMANANDA BERA, Indian Institute of Technology Roorkee — The influence of curvature parameter on fully developed mixed convective flow in a vertical annulus filled with porous medium under local thermal non-equilibrium (LTNE) state has been addressed here. Since the curvature parameter(C) describes the size of the enclosure, therefore the main emphasize is given to understand its impact on other controlling parameters. Based on computational results, C has a significant impact on both heat transfer rate as well as flow profiles for stably stratified flow. It has a tendency to reduce the magnitude of the maximum velocity. It is also observed that depending on other parameters, increment in C may have tendency to make the velocity profile free from back flow. The heat transfer rate is obtained maximum at a small value of C which is independent of media permeability and converges asymptotically on increasing$C$. At the end, the linear stability analysis based on normal mode technique has been used to verify the results obtained from basic flow study. Overall, from both basic flow as well as linear stability results, it is found that increment in C makes the flow profile smooth which means C has tendency to stabilize the flow.

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