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Pulsating Flow through Vertical Porous Channel with Viscous Dissipation Effect

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Abstract: This study investigates the effect of viscous dissipation on the pulsatile flow through a vertical porous channel subjected to periodic heating at the heated walls. The flow governing equations are transformed into corresponding nondimensional form. The dimensionless nonlinear coupled system of partial differential equations are then reduced to ordinary differential equations. Approximate solutions in the form of Adomian decomposition method (ADM) are obtained and the solutions are shown to be convergent. Important properties of the overall structure of the flow are presented and discussed including skin friction and Nusselt number.

Keywords: ADM, Pulsatile flow, Porous channel, Periodic heat input, Skin friction, Heat transfer