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Irreversibility Analysis in Micropolar Fluid Film along an Incline Porous Substrate with Slip Effects

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Abstract: The current article examined the semi-analytical solution for the rate of entropy generation in a steady, gravitydriven thin film flow of a micropolar fluid descending over a heated inclined substrate with slip constraints. A comprehensive semi-analytical approach (differential transformation method (DTM)) was instrumental in obtaining the solution of the nonlinear governing model. The characteristics of velocity, angular velocity, heat balance, entropy generation, skin-friction, wall couple stress, Nusselt number and Bejan number have been deliberated under the influence of involved flow controlling physical parameters. The outcomes of the present study shows that an incline in values of Microrotation parameter declines the velocity gradient and inclines thermal, dimensionless Bejan number and entropy generation profiles.

Keywords: Micropolar fluid, Porous medium, Entropy generation, Incline substrate, DTM