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Analytical Solutions for Corotational Maxwell Model Fluid Arising in Wire Coating inside a Canonical Die

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Abstract : The present paper applies the optimal homotopy perturbation method (OHPM) and the optimal homotopy asymptotic method (OHAM) introduced recently to obtain analytic approximations of the non-linear equations modeling the flow of polymer in case of wire coating of a corotational Maxwell fluid. Expression for the velocity field is obtained in non-dimensional form. Comparison of the results obtained by the two methods at different values of non-dimensional parameter l₁₀, reveal that the OHPM is more effective and easy to use. The OHPM solution can be improved even working in the same order of approximation depends on the choices of the auxiliary functions.

Keywords : corotational Maxwell model, optimal homotopy asymptotic method, optimal homotopy perturbation method, wire coating die
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