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Numerical investigation fluid velocity and heat transfer on the stretching sheet by VIM method and optimization fluid temperature and velocity parameter by Prandtl number and viscoelastic parameter

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Abstract

This study aimed at investigating the variation of heat transfer and velocity changes of the fluid flow along the vertical line on a surface drawn from both sides. In the beginning, the several parameters such as Prandtl number and viscoelastic effect evaluated for heat transfer and fluid velocity by variation Iteration method. The results were compared with the numerical method. The second part of the description relates to the use RSM method in the Design Expert software. In this paper by using the RSM method, optimized the fluid velocity and heat transfer passing from the stretching sheet. By increasing the Prandtl number, the convection heat transfer 43 % increased ratio the minimum Prandtl number. In accordance with balanced modes for Prandtl number and viscoelastic parameter and wall temperature, the best optimization occurred for fluid velocity and fluid temperature with f=0.67 and θ=0.606. The results of variation iteration method are accurate for the nonlinear solution. As the value of k increases, the value of fluid velocity indicates an increase and by increase Prandtl number, the value of Temperature decreases.

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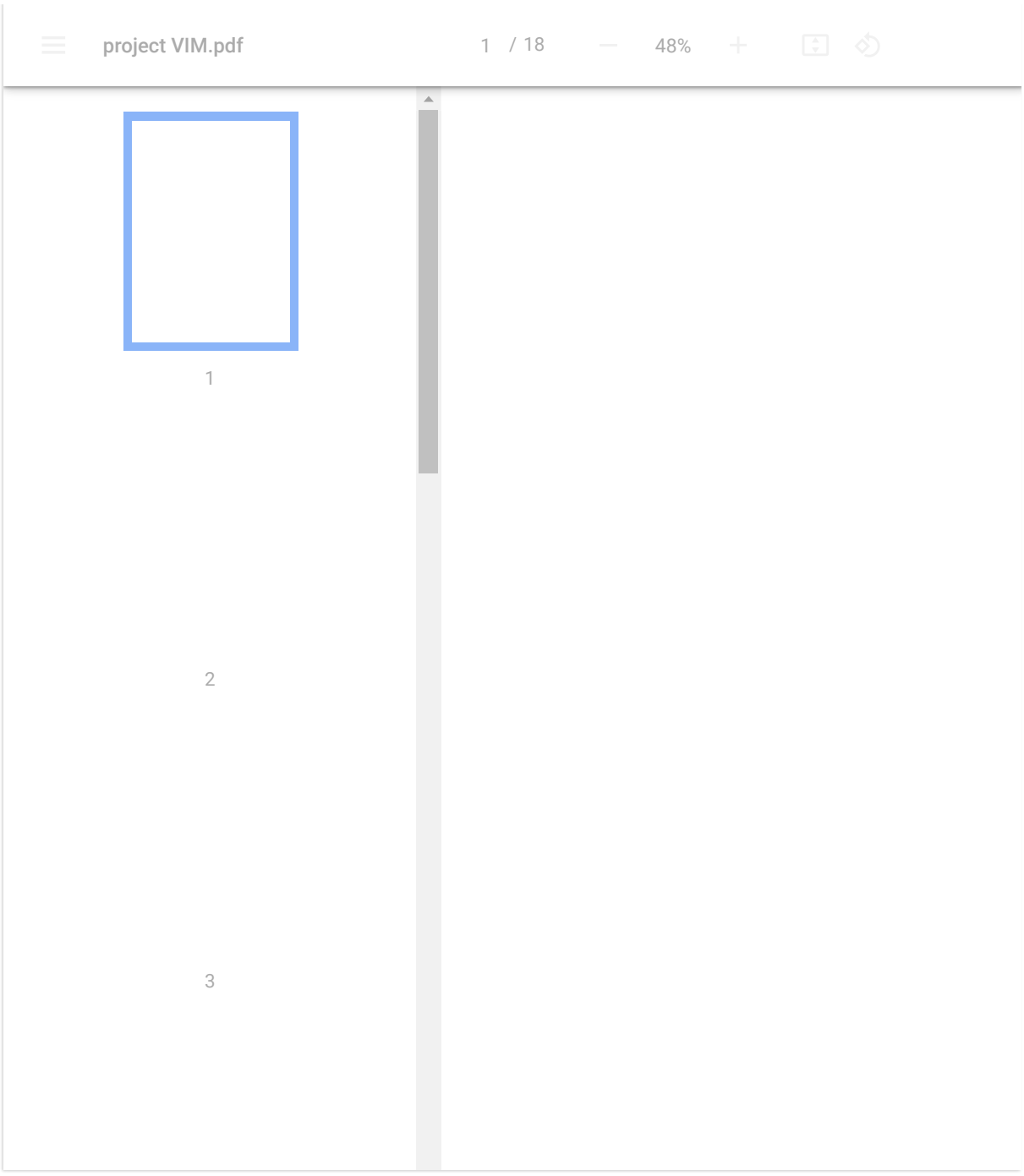

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