On the heat transfer and flow of a non-homogenous fluid JOSEPH FIORDILINO, ASHWIN VAIDYA, Department of Mathematical Sciences, Montclair State University, MEHRDAD MASSOUDI, U.S. Department of Energy, National Energy Technology Laboratory — In this study, we consider the flow of a complex fluid such as coal-water slurry or biomass. We assume the suspension can be modeled as a non-homogenous viscous fluid whose viscosity is a function of space and temperature. We study the heat transfer and the steady fully developed flow of this complex fluid between two long horizontal plates subject to the no-slip condition at the plates. Two different correlations are proposed for the viscosity and the thermal conductivity and analytical and numerical results are presented for the velocity, temperature and the volumetric flow rate.

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