1161-34-5 **Joseph Paullet*** (jep7@psu.edu), School of Science, Penn State Behrend, 4205 College Drive, Erie, PA 16509, and **Joseph Previte**. *Analysis of Flow Past a Permeable Stretching/Shrinking Sheet.*

We analyze a recently proposed model for boundary layer flow of a nanofluid past a permeable stretching/shrinking sheet. The boundary value problem (BVP) governing fluid velocity reduces to:

$$f'''(\eta) + f(\eta)f''(\eta) - f'(\eta)^2 = 0, \qquad 0 < \eta < \infty,$$

subject to

$$f(0) = S, \quad f'(0) = \lambda, \quad f'(\infty) = 0,$$

where λ measures the stretching ($\lambda > 0$) or shrinking ($\lambda < 0$) of the sheet, and S controls the suction ($S > 0$) or injection ($S < 0$) of fluid through the sheet.

For $\lambda \geq 0$ and $S \in \mathbb{R}$, we present a closed-form solution to the BVP and prove that this solution is unique. For $\lambda < 0$ and $S < 2\sqrt{-\lambda}$ we prove no solution exists. For $\lambda < 0$ and $S = 2\sqrt{-\lambda}$ we present a closed-form solution to the BVP and prove that it is unique. For $\lambda < 0$ and $S > 2\sqrt{-\lambda}$ we present two closed-form solutions to the BVP and prove the existence of an infinite number of solutions in this parameter range. The analytical results proved here differ from the numerical results reported in the literature. We discuss the mathematical aspects of the problem that lead to the difficulty in obtaining accurate numerical approximations to the solutions. (Received June 26, 2020)