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Comment on the Paper "Duel Solutions in Hiemenz Flow of an Electro-Conductive Viscous Nanofluid Containing Elliptic Single-/Multi-Wall Carbon Nanotubes With Magnetic Induction Effects" (Ferdows, M., Tahia, T., Bég, O. A., and Bég, T. A., 2022, ASME Open J. Eng., 1, p. 011040)

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Some serious errors exist in the above paper. [DOI: 10.1115/1.4063085]

In the above paper, the boundary conditions for the non-dimensional velocity, non-dimensional induced magnetic field (IMF), and non-dimensional temperature are as follows (Eq. (30) in Ref. [1]):

$$f'(\eta) = A,\ g'(\eta) = 1,\ \theta(\eta) = 0 \text{ as } \eta \to \infty \qquad (1)$$

In the above condition $\eta \to \infty$ means a very long η. In Fig. 1 of the present work, it is shown schematically a dimensionless velocity profile from Ref. [1], taken from Fig. 13 and a second velocity profile proposed by the present author (sketch). It is seen that the velocity profile presented in Ref. [1] does not approach the ambient condition asymptotically but intersects the horizontal axis with a steep angle. In the same figure, it is shown a correct velocity profile which extends to high values of transverse component η and approaches smoothly the ambient condition. From Fig. 13 in Ref. [1], the calculations have been restricted to a maximum η equal to 5 ($\eta_{max} = 5$). It is obvious that this calculation domain is insufficient to capture the real shape of profiles and a higher value of η is needed.

In Sec. 5.5 in Ref. [1], it is written "These profiles satisfy the boundary conditions and converge asymptotically." It is obvious that this statement is not valid. According to above analysis, all profiles in Figs. 10, 11, 13, 14, 16, and 17 in Ref. [1] are truncated and wrong. In addition, all temperature profiles for the second solution in Figs.

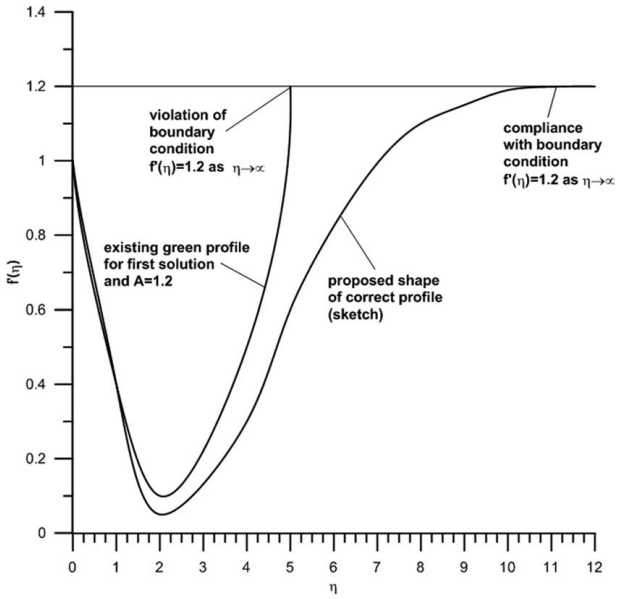

Fig. 1 The existing dimensionless velocity profile is given in Ref. [1] in Fig. 13 (green profile for the first solution) for $A = 1.2$. The proposed profile is in agreement with the boundary condition (1). The existing profile violates the boundary condition $f'(\eta) = A = 1.2$ as $\eta \to \infty$.

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12, 15, and 18 are also truncated and wrong (the temperature profiles for the first solution are correct). More information on the truncation error is given by Pantokratoras [2], Pantokratoras [3]. Recently a similar paper with truncated profiles has been retracted [4].

References

[1] Ferdows, M., Tazin, T., Bég, O. A., and Bég, T. A., 2022, "Duel Solutions in Hiemenz Flow of an Electro-Conductive Viscous Nanofluid Containing Elliptic Single-/Multi-Wall Carbon Nanotubes With Magnetic Induction Effects," ASME Open J. Eng., **1**, p. 011040.

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[4] Saleem, M., Tufail, M. N., and Chaudhry, Q. A., 2021, "Retraction Note: One-Parameter Scaling Transformations of Maxwell Nanofuid with Ludwig–Soret and Pedesis Motion Passed Over Stretching–Shrinking Surfaces (Microfluidics and Nanofluidics, (2021), 25(3), 28, 10.1007/s10404-021-02431-0)," Microfluid. Nanofluidics, **25**(8), p. 70.