Asterios Pantokratoras:* Comments to "Homotopy Simulation of Dissipative Micropolar Flow and Heat Transfer from a Two-Dimensional Body with Heat Sink Effect: Applications in Polymer Coating" by O. A. Bég, B. Vasu, A. K. Ray, T. A. Bég, A. Kadir, H. J. Leonard, R. S. R. Gorla

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Abstract

Some errors exist in the above paper.

1.

In a Physics equation all terms must have the same units. Taking into account this principle from the angular momentum equation (7) in [1] it is found that the units of parameter j are m^2 and the units of parameter γ are kg m s^{-1}.

However in Nomenclature in [1] it is written that the units of j are m^{-1}.

2.

In Nomenclature in [1] it is written that the units of γ are kg m^{-1} s^{-1}.

3.

The dimensionless parameter I in equation (10) in [1] is as follows

$$I = \frac{\nu^2 \,\mathrm{Re}}{j\dfrac{U^2}{c_p(T-T_\infty)}} \tag{1}$$

where ν (m^2 s^{-1}) is the fluid kinematic viscosity, Re (dimensionless) is the Reynolds number, U (m s^{-1}) is the free stream velocity, c_p (m^2 s^{-2} Kelvin^{-1}) is the fluid specific heat and T (Kelvin) is the fluid temperature. From equation (1) it is found that the units of I are s^{-1}. Therefore the equation (1) is wrong.

4.

In section HAM results and discussion in [1] the parameter I is written as follows

$$I = \frac{\nu^2 \,\mathrm{Re}}{jU^2\dfrac{U^2}{c_p(T-T_\infty)}} \tag{2}$$

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5.

The dimensionless similarity variable η in equation (10) in [1] is as follows

$$\eta = \left(\frac{(m+1)U}{2\nu x}\, y\right)^{1/2} \tag{3}$$

where x, $y(m)$ are the Cartesian coordinates. From equation (3) it is found that the units of η are $m^{-1/2}$. This means that the equation (3) is wrong.

6.

In equation (2) in [1] the units of the term $\kappa\nabla\times V$ are kg m^{-2} s^{-1} instead of kg m^{-2} s^{-2}.

7.

In equation (3) in [1] the units of the term $\kappa\nabla\times V$ are kg m^{-1} s^{-2} instead of kg m^{-1} s^{-1}.

8.

The parameter K in Nomenclature is dimensional whereas it is dimensionless.

9.

In Nomenclature the units of dynamic viscosity μ are given as m^2 s^{-1} instead of kg m^{-1} s^{-1}.

10.

The same parameter m is used in equation $U - cx^m$ and in the Hartree parameter. It creates confusion.

11.

In Nomenclature it is written that the units of parameters α , β are kg m^{-1} s^{-1}. The correct units are kg m s^{-1}.

12.

The dimensionless Eckert number has not been defined in the paper.

13.

The dimensionless Prandtl number has not been defined in the paper.

14.

The dimensionless Reynolds number has not been defined in the paper.

References

1. *Bég, O. A., Vasu, B., Ray, A. K., Bég, T. A., Kadir, A., Leonard, H. J., Gorla, R. S. R.*, Homotopy simulation of dissipative micropolar flow and heat transfer from a two-dimensional body with heat sink effect: Applications in polymer coating, Chem. Biochem. Eng. Q. **34** (2020) 257–275.

Comment of the Editors: the authors of the paper did not respond to the comment.