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Comment on “Effects of homogeneous–heterogeneous reactions in flow of magnetite-Fe<sub>3</sub>O<sub>4</sub> nanoparticles by a rotating disk, Tasawar Hayat, Maria Imtiaz, Ahmed Alsaedi, Faris Alzahrani, Journal of Molecular Liquids 216 (2016) 845–855”



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### Abstract

The present comment concerns some doubtful results included in the above paper.

In the above paper the energy equation is as follows (equation 7 in [1])

$$u \frac{\partial T}{\partial r} + w \frac{\partial T}{\partial z} = \alpha_{nf} \left( \frac{\partial^2 T}{\partial r^2} + \frac{1}{r} \frac{\partial T}{\partial r} + \frac{\partial^2 T}{\partial z^2} \right) + \frac{\mu_{nf}}{(\rho c_p)_{nf}} \left[ 2 \left\{ \left( \frac{\partial u}{\partial r} \right)^2 + \left( \frac{u}{r} \right)^2 + \left( \frac{\partial w}{\partial z} \right)^2 \right\} + \left( r \frac{\partial}{\partial r} \left( \frac{v}{r} \right) \right)^2 + \left( \frac{\partial v}{\partial z} \right)^2 + \left( \frac{\partial u}{\partial z} + \frac{\partial w}{\partial r} \right)^2 \right] \quad (1)$$

and the similarity variable is (equation 16 in [1])

$$\eta = \sqrt{\frac{\Omega}{\nu_f}} z \quad (2)$$

The temperature has been nondimensionalized as (equation 16 in [1])

$$\theta(\eta) = \frac{T - T_\infty}{T_w - T_\infty} \quad (3)$$

From equation (2) it is clear that the similarity variable  $\eta$  depends only on  $z$ . From the energy equation (1) it is seen that the temperature depends on

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