Appendix

LIST OF SYMBOLS

a  wave number
b  specific heat
\( c_v \)  specific heat at constant volume
C  speed of light
d  thickness of the horizontal layer
\( D_B \)  Brownian diffusion coefficient
\( D_T \)  thermophoretic diffusion coefficient
Da  Darcy number
\( D_{T_C} \)  diffusivity of Dufour type
\( D_{C_T} \)  diffusivity of Soret type
e  charge of electron
F  stress relaxation parameter
\( g \)  acceleration due to gravity
H  magnetic field
\( H_s \)  constant of heat source strength
\( j_p \)  mass flux
\( k_{I_m} \)  medium permeability
\( k_m \)  thermal conductivity of porous medium
k_B  Boltzmann constant
k_x,  wave numbers in x- direction
k_y  wave numbers in y- direction
Le  Lewis number
Ls  thermosolutal Lewis number
M  Hall effect parameter
n  growth rate of disturbances
N  electron number density
\( N_A \)  modified diffusivity ratio
\( N_B \)  modified particle -density increment
\( N_{C_T} \)  Soret parameter
Greek Symbols

\(\alpha\) thermal expansion coefficient
\(\alpha_C\) analogous to solute concentration
\(\mu\) viscosity
\(\tilde{\mu}\) effective viscosity
\(\mu'\) kinematic visco-elasticity
\(\mu_e\) magnetic permeability
\(\lambda\) relaxation time
\(\varepsilon\) porosity
\(\Omega\) angular velocity
\(\rho\) density of the fluid
\(\rho_f\) density of base fluid
\(\rho_c\) heat capacity of nanofluid
\((\rho c)_m\) heat capacity of nanofluid in porous medium
\((\rho c)_p\) heat capacity of nanoparticles
\(\phi\) volume fraction of the nanoparticles
\(\phi_0\) volume fraction of the nanoparticles at reference scale
\( \rho_p \)  

density of nanoparticles

\( \varsigma = \frac{\partial v}{\partial x} - \frac{\partial u}{\partial y} \) 

\( z \)-components of vorticity

\( \xi = \frac{\partial h_y}{\partial x} - \frac{\partial h_x}{\partial y} \) 

thermal diffusivity

\( \kappa' \) 

solutal diffusivity

\( \sigma \) 

thermal capacity ratio

\( \omega \) 

dimensionless frequency of oscillation

\( \varsigma \) 

\( z \)-components of current density

\( \eta \) 

thermal anisotropy parameter

\( \delta h(z) \) 

variable gravity parameter

**Superscripts**

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non-dimensional variables

'' 

perturbed quantity

**Subscripts**

\( p \) 

particle

\( f \) 

fluid

\( b \) 

basic state

\( 0 \) 

lower boundary

\( 1 \) 

upper boundary

\( s \) 

stationary

\( osc \) 

oscillatory

\( c \) 

critical

\( H \) 

horizontal plane

\( D \equiv \frac{d}{dz} \).