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## NOMENCLATURE

Al <sub>2</sub> O <sub>3</sub>	Aluminum oxide
C <sub>p</sub>	Specific heat of the fluid, $J/kgK$
CuO	Copper oxide
d <sub>f</sub>	Diameter of base fluid molecule
d <sub>p</sub>	Nanoparticle diameter, $m$
g	Gravitational acceleration, $m/s^2$
k	Thermal conductivity, $W/mK$
k <sub>eff</sub>	Effective thermal conductivity
L	Length of the tube, $m$
M	Molecular weight of base fluid
Avogadro No,	$N = 6.022 \times 10^{23} mol^{-1}$
Nu	Nusselt number,
P	Pressure of fluid, $Pa$
Pr	Prandtl number, $Pr = C_p \mu_0 / k$
q <sub>x</sub>	Heat flux, $W/m^2$
Re	Reynolds number, $Re = \rho_0 V_0 D / \mu_0$
R <sub>np</sub>	Nanoparticle radius, $m$
Ri	Richardson number, $Ri = Gr / Re$
SiO <sub>2</sub>	Silicon oxide
T	Temperature of fluid, $K$
T	Bulk temperature, $K$
T <sub>0</sub>	Reference temperature
	Velocities in x', y' and z' directions, $m/s$
	Dimensionless velocities in x, y and z directions
	Average jet velocity at the entrance, $m/s$
V	Axial velocity, $m/s$
	Zinc oxide

## Greek symbols

μ <sub>eff</sub>	Effective viscosity
α	Thermal diffusivity, $m^2/s$
μ	Dynamic viscosity of fluid, $kg/m \cdot s$
ν	Kinematic viscosity of fluid, $m^2/s$
θ	Inclination of tilted wall
ρ	Fluid density, $kg/m^3$
ρ <sub>1</sub>	Nanofluid density $kg/m^3$
φ	Volume fraction of nanoparticles

## Subscript

b <sub>f</sub>	base-fluid
n <sub>f</sub>	nanofluids
n <sub>p</sub>	nanoparticle
eff	effective