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An Investigation on an Ethylene Glycol/Water Nanofluid for Heavy Vehicle Cooling Applications

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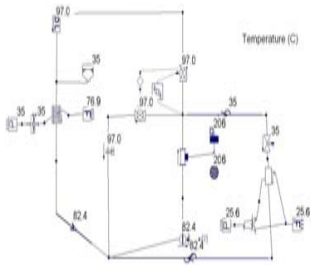
Poster Location: P-13

Rationale: ***Use of nanofluid with enhanced thermal properties has the potential to reduce (a) radiator frontal area, which in turn can reduce aerodynamic drag and hence increase fuel economy; and (b) coolant pumping power.***

Approach: ***Conduct both a modeling and an experimental investigation to identify and demonstrate the viability of nanofluids for heavy vehicle cooling applications.***

Simulation of 500 hp Truck Engine



Flowmaster

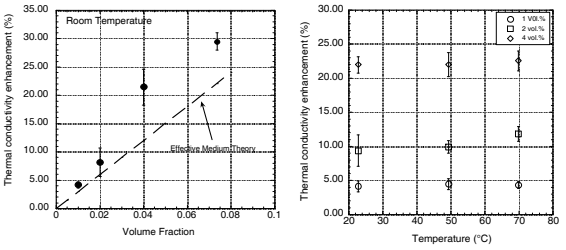
Outcome of Simulations

4 vol.% CuO in 50-50 water/ethylene glycol mixture

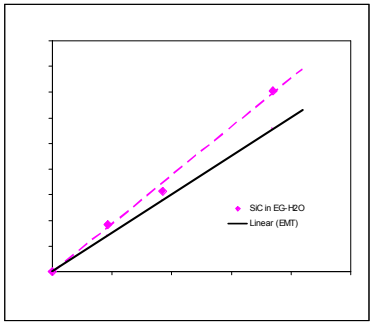
- 5% airside area reduction
- Reduced aerodynamic drag

➢ 2.5% increased fuel economy

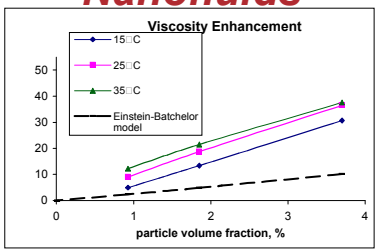
SiC/Water Nanofluid



SiC/Water/EG Nanofluid



Mechanical Effects of Nanofluids



Erosion of radiator material from nanofluids does not appear to be a factor

Nanofluids with enhanced thermal properties have the potential for increased fuel savings