

**Heat transfer characteristics of multi-walled carbon nanotubes suspension in a developing channel flow**

**Authors:** E Elnajjar, Y Haik, MO Hamdan, S. Khashan

**Abstract:** The present study experimentally investigates the effect of multi wall carbon nanotubes (MWCNT) suspensions on the convective heat transfer coefficients. The MWCNT suspensions used in this study were prepared by dispersing MWCNTs in deionized water 0.25 wt% arab gum solution. The heat transfer characteristics were measured for thermally developing laminar flow in a finite length horizontal circular pipe under isothermal wall conditions. The study was conducted over a range of Reynolds number of 300-2,300, based on 0.8 mm tube diameter. Results indicate enhancements of the convective heat transfer coefficient as a function of Reynolds number and volume fractions. An average enhancement of heat transfer coefficient of 50 % was observed over the base fluid. An overall increase of pumping force varying from 20 to 30 % over the flowing range is observed. The results suggest an optimum MWCNT volume fraction point of 0.1 % which gives the best heat transfer enhancement