

## **Numerical Solutions of Forced Convection Boundary Layer Flow on a Horizontal Circular Cylinder with Newtonian Heating**

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### **ABSTRACT**

This study considers the steady forced convection boundary layer flow over a horizontal circular cylinder, generated by Newtonian heating in which the heat transfer from the surface is proportional to the local surface temperature. The governing boundary layer equations are first transformed into a system of non-dimensional equations via the non-dimensional variables, and then into non-similar equations before they are solved numerically using a numerical scheme known as the Keller box method. Numerical solutions are obtained for the skin friction coefficient and the local wall temperature as well as the velocity and temperature profiles.

Keywords: Forced convection, horizontal circular cylinder, Newtonian heating, numerical solution