

**A STUDY ON THE CONVECTION HEAT TRANSFER IN A  
FLUID FLOW OVER IMMERSED CURVED SURFACE**

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## **ABSTRACT**

In this study, the velocity distribution, the variation of temperature and effects of the convection heat generated within the boundary layer for a fluid flowing over an immersed curved surface were discussed. Most of the research investigations and findings always give emphasis to circulation that results to lift (as explained by Kutta-Joukowski hypothesis; Blasius and Kelvin's theorems), the effects of Shock waves and the formation of drag due to skin friction or as a result of the occurrence of separation at the trailing vortex/edge. This research study is on the extent to which mass and heat transfer have to both lift and drag, respectively on an immersed curved surface.

In this study, the continuity, the momentum and thermal energy equations were nondimensionalised and the solutions were approximated by use of the finite-difference method. From this research study, the convection heat generated due to the viscous effect on the curved surface is high within the boundary layer, thus affecting the lift and drag force.. The findings would go a long way in assisting Engineers in making necessary design and estimate improvements where such situations warrant, for instance in aerodynamics and thermal turbomachinery applications.