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TWO PHASE STRUCTURE OF THE CONDENSATION BOUNDARY LAYER ON AN ACCELERATED PLATE

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Dedicated to Prof. K. Srinivasa Rao on his 75^{th} ***Birth Anniversary***

Abstract: In this paper, the condensation heat transfer and the structure of the dispersed, two-phase, two-component boundary layer are studied under forced convection condition on a flat plate moving with constant velocity.

Keywords and Phrases: Two phase , two component flow, boundary layer,etc.

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1. Introduction

Forced convection condensation on a flat plate in the presence of a non-condensing gas has been studied by many researchers. Sparrow(1967), in his work, assumed that the vapour was saturated in the main stream and on the interface. But the probability of droplet formation has not been considered. Hijikata and Mori in (1973) assumed that the vapour is saturated throughout the boundary layer and that droplets appear to avoid any metastable state of vapours. They neglected the heat resistance of the film, assuming that the heat resistance of the film, assuming that the temperature of the interface was equal to the temperature of the plate of surface. Taking all these assumptions Legay in (1984) and Leagay and Prunet in (1985, 86) solved the two-phase boundary layer equations, numerically by a finite difference method.

Poinsot and Huetz in (1985) and Sekulic in (1985) proposed another approach to the thermodynamic modeling of the boundary layer, for somewhat different problems, Poinsot and Huetz (1985) studied the condensation of quiescent vapour in the presence of non condensing gas on a cylindrical surface. Sekulrc (1985) investigated the problem of free connection condensation in the presence of non-condensing gas on a vertical cryosurface.