

Non-equilibrium evaporation and condensation processes: analytical solutions

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Abstrak

This monograph is focused mostly on the exposition of analytical methods for the solution of problems of strong phase change. A new theoretical model is proved useful in describing, with acceptable accuracy, problems of strong evaporation and condensation. The book is the first to treat the problem of asymmetry for evaporation/condensation. A semi-empirical model for the process is proposed for purposes of practical calculation of the process of strong evaporation. The limiting schemes of the vapor bubble growth are analyzed. The thermo-hydrodynamic problem of evaporating meniscus of a thin liquid film on a heated surface is considered. A theoretical analysis of the problem of evaporation of a drop levitating over a vapor cushion is performed. The problem of vapor condensation upon a transversal flow around a horizontal cylinder is considered.