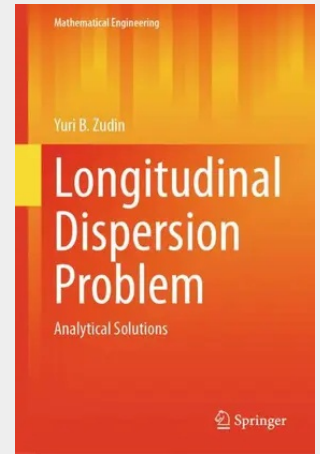


Longitudinal Dispersion Problem

Analytical Solutions

The present book considers the generalization of the universal method of investigation of the periodic conjugate problem of heat transfer to the case of mass transfer through the interphase. We describe the effect of periodic pulsations of hydrodynamic parameters on the averaged mass transfer through the interphase boundary between moving media. In this way, we obtain a generalization of the classical analogy between heat and mass transfer. The general problem of averaging of parameters of unsteady mass transfer (concentration and mass flux on a mass transfer surface, boundary conditions, mass transfer coefficient) is also considered. We introduce the concepts of the "true" and "effective" mass transfer coefficients and of the "averaging factor". We obtain analytical solutions for the main variants of periodic variation of the true mass transfer coefficient. The averaging factor is evaluated in analytical form (sums of infinite continued fractions and infinite series), and in the form of graphs and nomograms. Asymptotic formulas of the solutions are obtained. The book will be useful for researchers and graduate students engaged in research on unsteady convective mass transfer.

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