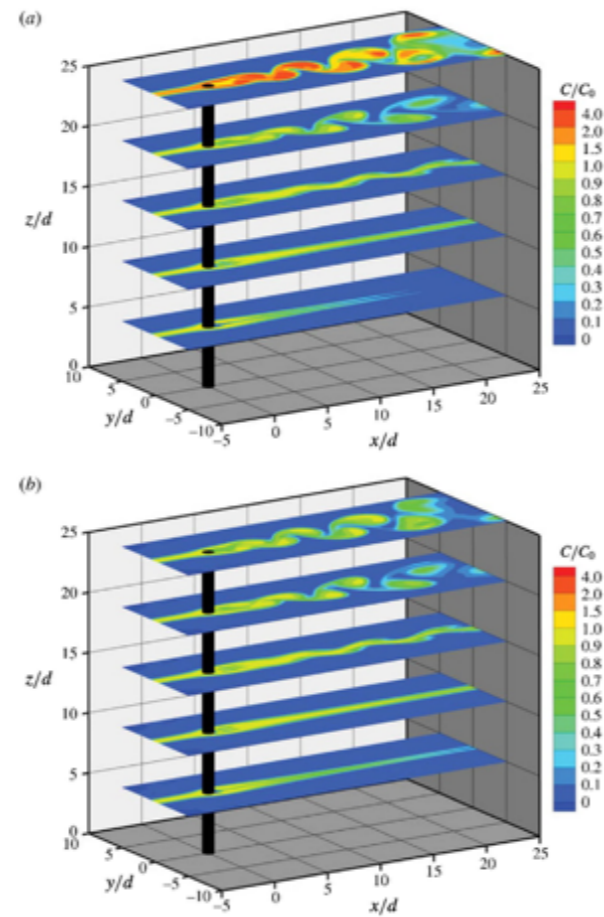


论文类成果

Distribution of gyrotactic micro-organisms in complex three-dimensional flows. Part 1. Horizontal shear flow past a vertical circular cylinder



【创新性】

针对微生物游动的随机性与趋向性特点，提出了模拟复杂三维流动中游动型微生物浓度分布的半解析半数值计算方法，发现了湿地生态系统中微生物在挺水植被尾涡区聚集的特征、规律与水动力机理。

【影响力】

研究成果连载于流体力学领域顶级期刊《Journal of Fluid Mechanics》。该成果是微生物游动对藻类分布影响研究领域的重要进展，所提出的计算方法可直接应用于多种环境水体，已被异重流、浮射流环境中水华暴发预报所采用。

主要完成人：曾 利、T. J. Pedley

获奖单位：水力学所

DISTRIBUTION OF GYROTACTIC MICRO-ORGANISMS IN COMPLEX THREE-DIMENSIONAL FLOWS. PART 1. HORIZONTAL SHEAR FLOW PAST A VERTICAL CIRCULAR CYLINDER

【 Innovation 】

According to the randomness and tropism characteristics of the suspension of micro-organisms, the paper presents a semi-analytical and semi-numerical calculation method for simulating the concentration distribution of gyrotactic micro-organisms in complex three-dimensional flows, and discovers the characteristics, law and hydrodynamic mechanism for micro-organisms' aggregation in the wake of emerged vegetation.

【 Influence 】

Research findings are published on the Journal of Fluid Mechanics, a top-level journal in the field of fluid mechanics; Research findings are the important progress in the research field of the impact of micro-organisms' swimming on algal distribution. The proposed calculation method can be directly applied to various water bodies, which has been adopted to predict the harmful algal blooms in gravity currents and buoyant jets.

Main Contributor : L. Zeng, T.J. Pedley

Award-winning Unit : Department of Hydraulics

