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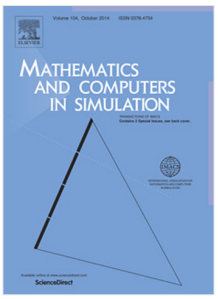

Effect of rhizosphere dispersal and impulsive input on the growth of wetland plant

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Effect of rhizosphere dispersal and impulsive input on the growth of wetland plant [1]

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Abstract

Modelling the wetland plant-nutrient interaction is significant for elucidating the complex mechanisms of the nutrient absorption. In this paper, the effect of pollutant dispersal and impulsive input on the growth of wetland plant is presented. By using the theory of impulsive differential equations, we obtain that the wetland plant-eradication periodic solution is globally asymptotically stable if some conditions are satisfied. In addition, the permanent conditions are given by means of the comparison theorem of impulsive differential equations. Finally, numerical simulations are given to justify our results.

Key words: Wetland plant-nutrient interaction, Rhizosphere diffusion, Impulsive input, Wetland plant-eradication periodic solution.

AMS subject classification: 34C05, 92D25

1. Introduction

With the development of industry and agriculture, eutrophication usually causes the rapid increase of the algae and decrease of the dissolved oxygen in the water body, which becomes one of the most factors resulting in the deterioration of water quality. Therefore, it is necessary to carry out effective measures to reduce water pollution. Phytoremediation is the most efficient and cost-effective approach to solve the oversupply problem of the nutrients such as nitrogen and phosphorus because of its high removal efficiency of pollutants. Since the wetland plant can take up nutrients from the rhizosphere, degradation

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