

盾构近距离施工的IMC-PID控制模型研究

廖少明¹, 汪敏², 侯学渊¹

(1. 同济大学 地下建筑与工程系, 上海 200092; 2. 上海市市政工程设计研究总院, 上海 200092)

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摘要 针对盾构近距离施工中变形控制的特点, 以变形控制为目标, 采用系统控制论的思想和方法, 提出一种基于内模控制的IMC-PID参数整定方法的盾构施工控制方法。分析研究盾构施工控制中正面土压力和盾尾注浆两个关键参数对相邻隧道变形影响的全过程控制模型APLOC。仿真结果显示, 此控制模型具有很好的稳定性和鲁棒性。实际控制效果明显, 相邻隧道变形控制在5 mm之内。

关键词 [隧道工程](#); [盾构](#); [近距离施工](#); [变形](#); [IMC-PID控制](#)

分类号

STUDY ON IMC-PID CONTROL MODEL OF SHIELD ADJACENT CONSTRUCTION

LIAO Shaoming¹, WANG Min², HOU Xueyuan¹

(1. Department of Geotechnical Engineering, Tongji University, Shanghai 200092, China;
2. Shanghai Municipal Engineering Design General Institute, Shanghai 200092, China)

Abstract

According to the features of control in shield adjacent construction, the control model of the whole process—APLOC has been established based on IMC-PID controller with consideration of the effects of earth balance pressure at workface and shield tail grouting parameter on ground deformation. The influences of the earth pressure and the grouting parameter on the ground and the adjacent tunnel settlement have been studied and analyzed by APLOC. Simulation results show that the proposed controller model has the features of excellent stability and robustness. The maximum settlement of the adjacent tunnel is successfully controlled within 5 mm making use of this control model.

Key words [tunnelling engineering](#); [shield](#); [adjacent construction](#); [deformation](#); [IMC-PID control](#)

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