Analytical Method for PID Controller Tuning in the Smith Predictor System

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In this paper, an efficient analytical method for PID controller tuning of the Smith predictor systems is proposed. The H2 suboptimal controller is analytically derived for general class of stabl processes based on the Maclaurin expansion approach. Since the method gives a simple analytical form and has only one tuning parameter for adjusting sysetm performance and stability, it can be easily used in practice. Simulation results are provided to demonstrate the availability of the proposed method.