New Parameter Tuning Method of Washout Filter-Aided Controller for Dynamic Behavior Adjustment

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New Parameter Tuning Method of Washout Filter-aided Controller for Dynamic Behavior Adjustment*

用于动态行为调控的冲洗型滤波器参数整定新方法

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Abstract Stabilizing unstable operating points is an effective way to enhance process benefits and safety, which motivates the development for a variety of advanced control strategies. The washout filter-aided controller (WFC), originally used for electric power system and aircraft, has been introduced to adjust the dynamic behavior of chemical process. However, the parameter tuning method faces two major limitations: the dimension of operating variables must be equal to or greater than that of state variables and only one positive real eigenvalue exists in the open loop system. To overcome the two limitations, this paper proposes a new parameter tuning method, so that the WFC is applicable in most chemical processes. By solving a constrained optimization problem, the controller parameters are determined under the constraint that the reassignment of the eigenvalues of the unstable desired operating point can satisfy the stability condition. Thus parts of the equilibrium manifold including the desired operating point are stabilized without affecting the shape of the

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