Development of Batch Proportional-Integral-Derivative Controller

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In this study, anew batch proportional-integral-derivative (PID) control method is developed.Previous batch control methods like iterative learning control (ILC) or run torun (R2R) control can significantly improve the control performance of thebatch process. But, a fairly accurate process model is required for the batchcontrollers to guarantee the expected good control performances and theimplementation is numerically very complicated so that it is difficult to beapplied to complex manufacturing processes. To overcomethese problems, a new batch PID control method is proposed, which borrows theconcept of PID control method. Simulation studies confirm that the proposedbatch PID controller shows acceptable control performances in tracking varioussetpoint trajectories and rejecting various disturbances and good robustness touncertainties such as noises and variation of the process dynamics.