

Nonlinear Model Predictive Control of Water Quality in Drinking Water Distribution Systems with DBPs Objectives

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Abstract : The paper develops a non-linear model predictive control (NMPC) of water quality in drinking water distribution systems (DWDS) based on the advanced non-linear quality dynamics model including disinfections by-products (DBPs). A special attention is paid to the analysis of an impact of the flow trajectories prescribed by an upper control level of the recently developed two-time scale architecture of an integrated quality and quantity control in DWDS. The new quality controller is to operate within this architecture in the fast time scale as the lower level quality controller. The controller performance is validated by a comprehensive simulation study based on an example case study DWDS.

Keywords : model predictive control, hierarchical control structure, genetic algorithm, water quality with DBPs objectives

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