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High-purity processes GLR control charts for composite change-point scenarios

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Generalized Likelihood Ratio (GLR)-based control charts for monitoring count processes have been proposed considering a variety of underlying distributions and they are known to outperform the traditional control charts in effectively detecting a wide range of parameters' shifts, while being relatively easy to design. In this study, generalized likelihood ratio tests for monitoring high-purity processes with composite null and alternative hypotheses for geometric and exponential distributions are designed and their performances are evaluated via simulations. Moreover, composite change-point scenarios relevant for testing more practical and realistic out-of-control scenarios in the chemical industry are considered, extending the traditional cases in which means shifts or linear trends are detected to more complex scenarios.

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