

Variable Selection Strategy using Wavelet Transform for Construction of Batch Process Quality Models

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This work propose a two-stage variable selection strategy performed in the wavelet domain in order to extract quality-related information from batch trajectories of process variables and to build parsimonious quality estimation models. The proposed method enables the determination from historical data of the following three kinds of information that are correlated with the quality of the final product: the time stages in which product quality is predominantly determined; their frequency components, which indicate how long the stages last; and the relative importance of these time stages. This information, which can be used to develop operation control guidelines, is obtained by reconstructing the important trajectories in the time domain from the subset of wavelet coefficients selected by the proposed variable selection method.