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SYSTEM ENGINEERING

化工过程柔性分析的改进模型

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摘要 This paper discussed an extended model for flexibility analysis of chemical process. Under uncertainty, probability density function is used to describeuncertain parameters instead of hyper-rectangle, and chanceconstrained programming is a feasible way to deal with the violation of constraints. Because the feasible region of control variables would change along with uncertain parameters, its smallest acceptable size threshold is presented to ensure the controllability condition. By synthesizing the considerations mentioned above, a modified model can describe the flexibility analysis problem more exactly. Then a hybrid algorithm, which integrates stochastic simulation and genetic algorithm, is applied to solve this model and maximize the flexibilityregion. Both numerical and chemical process examples are presented to demonstrate the effectiveness of the method.

关键词 柔性分析; 嵌入式模型; 随机模型;

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A Modified Model for Flexibility Analysis in Chemical Engineering Processes

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Key words: flexibility analysis; chanceconstrained programming; stochastic simulation; genetic algorithm;

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