



## **COST SENSITIVITY ANALYSIS BY MONTE CARLO SIMULATION**

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### **Abstract**

The cost sensitivity analysis of a chemical process was carried out through a sequence of three stages, using three different software applications. In the first stage an alkylation process was optimized with GAMS<sup>®</sup> software, the objective function being the profit. This optimization was repeated for the values of five different costs in the frame of a factorial experiment. In the next stage, the objective function-costs dependence was quantified with an artificial neural network, obtained with METANEURAL software. In the last step, on the base of this neural network, a study of cost sensitivity was realized using CRYSTAL BALL<sup>®</sup> software. The results consist in the percentage contributions of costs to the variance of the profit. The proposed original procedure can be successfully used to many other processes in chemical, biochemical, petroleum industry, or in environmental management applications.

*Keywords:* Monte Carlo simulation, sensitivity analysis, optimization, neural networks

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