Sensitivity Analysis in Optimization of Multiple Cyclone Arrangements

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Abstract

Sensitivity analysis is one of the most popular technique in modelling and optimization to understand how parameters influence the optimal objective function value. In this paper, a sensitivity analysis is performed to determine the most influential parameters in multiple cyclone arrangements optimization problem, including sensitivities of input feed conditions and constraints of decision variables with respect to the minimum total cost. A combination of two types of cyclone, i.e., 1D3D and 2D2D in multiple arrangements will be involved in the study. The analysis method used in this study has demonstrated the goodness and the applicability of proposed model in obtaining the best pollution control strategies to achieve a minimum level of pollution reduction.

Keywords
Sensitivity analysis, Superstructure optimization, Cyclone arrangement, GAMS software, Modeling.

Biography

Muhamad Fariz Failaka is a Master student in Department of Chemical Engineering, at the University of Waterloo, Ontario, Canada. He was supervised by Professors Ali Elkamel and Chandra Mouli R. Madhuranthakam. He earned S.T. in Chemical Engineering from Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia. His research interests are modeling, simulation, optimization, process design, and process safety. He is currently also a Certified Process Engineer in Process Engineering Department at PT Pupuk Kaltim, Bontang, Indonesia with over 7 years of working experience. He can be reached via email at: mffailaka@uwaterloo.ca

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a co-author of four books; two recent books were published by Wiley and entitled Planning of Refinery and Petrochemical Operations and Environmentally Conscious Fossil Energy Production.

Fethi Bellamine is a professor at University November 7, Institute of Applied Science and Technologies, Tunis, Tunisia. He holds BS, MS, and PhD degrees in Electrical Engineering from Colorado State and University of Colorado at Boulder, respectively. From 1995 to 2002, he served as a senior development engineer for Lucent Technologies, Alcatel Networks, and NESA. His research interests are in the areas of modeling and simulation, numerical methods, and soft computing.