

## ADVANCED CONTROL FOR AN ETHYLENE REACTOR

Dumitru POPESCU<sup>1</sup>,  
Catalin DIMON<sup>2</sup>, Severus OLTEANU<sup>3</sup>, Ciprian LUPU<sup>4</sup>

**Rezumat.** *Obiectivul central al acestei lucrări este de a dezvolta și implementa o soluție de control pentru procese petrochimice și anume controlul și optimizarea unui reactor de piroliza, instalație cheie în industria petrochimică. Sunt prezentate caracteristicile tehnologice ale acestui proces petrochimic și unele aspecte despre sistemul de control propus pentru instalația de etilenă. În cele din urmă, o soluție optimală este găsită, considerând că procesul are o structură neliniară multivariabilă. Rezultatele au fost implementate pe un ansamblu de reactoare de piroliză pe o platformă petrochimică din România.*

**Abstract.** *The main objective of this paper is the design and implementation of control solutions for petrochemical processes, namely the control and optimization of a pyrolysis reactor, the key-installation in the petrochemical industry. The authors present the technological characteristics of this petrochemical process and some aspects about the proposed control system solution for the ethylene plant. Finally, an optimal operating point for the reactor is found, considering that the process has a nonlinear multivariable structure. The results have been implemented on an assembly of pyrolysis reactors on a petrochemical platform from Romania.*

**Keywords:** *ethylene pyrolysis, numerical control system design, robust control, optimization*

### 1. Introduction

The petrochemical industry is still a fertile field from the perspective of the automatic control of technological processes and therefore, some of the most representative applications find their place in this area. In recent decades, the petrochemical industry has experienced an unprecedented development by upgrading their equipment and the production lines and also, by expanding their production capacity. The petrochemical industry is an important provider of products for population and industry (food, pharmaceuticals, mechanics, electronics, textiles, transportation) and remains a priority for the Romanian economy.

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<sup>1</sup>Prof. Eng., Faculty of Automatic Control and Computer Science, University “Politehnica”, Bucharest, Romania, full/corresponding member of the Romanian Academy (popescu\_upb@yahoo.com).

<sup>2</sup>Prof. Eng., PhD, Faculty of Automatic Control and Computer Science, University “Politehnica”, Bucharest, Romania.

<sup>3</sup>Researcher, “Control Engineering & Energy” SRL, Bucharest, Romania.

<sup>4</sup>Prof. Eng., Faculty of Automatic Control and Computer Science, University “Politehnica”, Bucharest, Romania.

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