



ΕΘΝΙΚΟ ΜΕΤΣΟΒΙΟ ΠΟΛΥΤΕΧΝΕΙΟ
ΣΧΟΛΗ ΧΗΜΙΚΩΝ ΜΗΧΑΝΙΚΩΝ

ΕΠΙΤΡΟΠΗ ΣΕΜΙΝΑΡΙΩΝ, Καθηγητής Α. Κοκόσης

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ΣΕΜΙΝΑΡΙΟ ΧΗΜΙΚΗΣ ΜΗΧΑΝΙΚΗΣ

Πέμπτη 2 Ιουνίου 2011, 13:00
Αίθουσα Σεμιναρίων «Ν. Κουμούτσου»

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**Process simulation, optimization and control of
cryogenic air separation units with frequent load
changes**

In response to frequently changing demands on gaseous products of cryogenic air separation units, an automatic load change (ALC) system is desired to optimally change the products and recycle rates under widely variable load conditions. However, due to the complex heat integration in the process, simulation and optimization of cryogenic air separation units (ASUs) often fails to converge with traditional Newton-based algorithms. A homotopy-based backtracking method (HBM) is presented and applied to the process operation of a cryogenic ASU under wide changes in load conditions. The results show that a large number of operating points that failed to converge with traditional algorithms can be successfully optimized with the HBM. An automatic load change system of cryogenic air separation process is also developed, in which, a two-level framework integrating real-time optimization with nonlinear model predictive control is designed. The industrial application results show the effectiveness of the automatic load change system.

During this presentation it is shown:

- The structure and the industrial application of the ALC system.
- The methodology of HBM and the application of the HBM in ASUs.
- The flowsheet characteristics of ASUs with complex heat integration.