

COMPLETE TITLE OF PAPER

Nonlinear Control of an Industrial Distillation Column by Exact Linearization

SPEAKER AND AUTHORS, WITH AFFILIATIONS AND COMPLETE MAILING ADDRESSES

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ABSTRACT

The dynamic behaviour of most chemical processes is governed by severely nonlinear differential equations. One way of designing controllers for such plants is to transform the nonlinear differential equations to linear ones by means of nonlinear change of coordinates and nonlinear feedback (exakt linearization).

For the resulting linear system a linear controller can be designed to guarantee stability and desired performance.

In this paper the methodology of exact linearization is applied to the input-output behaviour of a staged distillation column for binary separation. Aside from an outline of the nonlinear design procedure, experimental results from a pilot plant (40 trays) are presented. The achieved performance, as well as the effort needed to get the controller are compared to controller designs based on linear models using H_{∞} - and H_2 - optimization and the LQG/LTR-methodology.