

1. Record Nr.	UNINA9910437906503321
Autore	Shimjith S. R
Titolo	Modeling and control of a large nuclear reactor : a three-time-scale approach / / S.R. Shimjith, a.P. Tiwari, and B. Bandyopadhyay
Pubbl/distr/stampa	Heidelberg ; ; New York, : Springer, c2013
ISBN	9783642305894 364230589X
Edizione	[1st ed. 2013.]
Descrizione fisica	1 online resource (XXII, 138 p. 76 illus.)
Collana	Lecture notes in control and information sciences, , 0170-8643 ; ; 431
Altri autori (Persone)	TiwariA. P BandyopadhyayB (Bijnan)
Disciplina	621.483015118
Soggetti	Nuclear reactors - Mathematical models Nuclear reactors - Control
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references, index and glossary.
Nota di contenuto	Multipoint Kinetics Modeling of Large Nuclear Reactors -- Output Feedback Control Design -- Multiparameter Singular Perturbation of Linear Optimal Regulators -- Direct Block Diagonalization and Composite Control of Three-Time-Scale Systems -- Design of Fast Output Sampling Controller for Three-Time-Scale Systems.
Sommario/riassunto	Control analysis and design of large nuclear reactors requires a suitable mathematical model representing the steady state and dynamic behavior of the reactor with reasonable accuracy. This task is, however, quite challenging because of several complex dynamic phenomena existing in a reactor. Quite often, the models developed would be of prohibitively large order, non-linear and of complex structure not readily amenable for control studies. Moreover, the existence of simultaneously occurring dynamic variations at different speeds makes the mathematical model susceptible to numerical ill-conditioning, inhibiting direct application of standard control techniques. This monograph introduces a technique for mathematical modeling of large nuclear reactors in the framework of multi-point kinetics, to obtain a comparatively smaller order model in standard state space form thus overcoming these difficulties. It further brings in innovative methods for controller design for systems exhibiting multi-time-scale property,

with emphasis on three-time-scale systems.

---