

## Papers on PROCESS CONTROL by PSE-Lab

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**Keywords:** Process control; Multivariable control; Model based control; Model Predictive Control (MPC); Supervisory control; Optimal control; Robust control; Inverse response compensation; Process identification; Black-box models; Artificial Neural Networks (ANN); Distributed Control Systems (DCS).

- (2) **RIGOROUS DYNAMIC MODELLING AND CONTROL SYSTEM SYNTHESIS FOR DISTILLATION PROCESSES: AN INTEGRATED APPROACH**  
M. Rovaglio, T. Faravelli, G. Biardi, M. Banfi, D. Manca  
Proceedings of "ComChem: Computer Applications in Chemical Engineering", The Hague, The Netherlands, pp. 133-138, (1990)
- (5) **DYCODIS: A SIMULATION PACKAGE FOR RIGOROUS DYNAMICS NONLINEAR CONTROL OF DISTILLATION SYSTEMS**  
M. Rovaglio, T. Faravelli, D. Manca  
Proceedings of "ESM: European Simulation Multiconference", pp. 827-833, Copenhagen Denmark, (1991)
- (7) **RECONCILIATION, OPTIMIZATION AND SUPERVISORY CONTROL OF CRUDE OIL DISTILLATION SYSTEMS**  
D. Manca, M. Rovaglio, S. Pierucci, T. Faravelli  
The first Conference on Chemical and Process Engineering, pp. 255-259, Firenze, Italy, 13-15 Maggio, (1993)
- (17) **OPTIMAL CONTROL FOR INCINERATION PLANTS**  
M. Rovaglio, D. Manca, G. Biardi  
The Second Conference on Chemical and Process Engineering, pp. 261-265, Florence, Italy, 15-17 May, (1995)
- (21) **INVERSE RESPONSE COMPENSATION FOR THE OPTIMAL CONTROL OF MUNICIPAL INCINERATION PLANTS: MODEL SYNTHESIS AND EXPERIMENTAL VALIDATION**  
M. Rovaglio, D. Manca, G. Pazzaglia, G. Serafini  
Comp. Chem. Engng., Vol. 20, S1461-S1467, (1996)
- (23) **SUPERVISORY CONTROL AND ON-LINE OPTIMIZATION OF WASTE COMBUSTION PROCESSES**  
M. Rovaglio, D. Manca  
First European Congress on Chemical and Process Engineering, ECCE 1, Firenze, Italy, May 4-7, pp. 1932-1942, (1997)
- (25) **MODEL PREDICTIVE CONTROL AND ON-LINE OPTIMIZATION OF A SELECTIVE CATALYTIC REACTOR FOR NOX REMOVAL IN INCINERATION PLANTS**  
M. Rovaglio, D. Manca, M. G. Berretta, F. Rusconi  
Proceedings of International Conference on Incineration & Thermal Treatment Technologies, IT3, Salt Lake City, USA, pp. 661-668, (1998)
- (32) **INVERSE RESPONSE COMPENSATION AND CONTROL OPTIMIZATION OF INCINERATION PLANTS WITH ENERGY PRODUCTION**  
D. Manca, M. Rovaglio, G. Pazzaglia, G. Serafini  
Comp. & Chem. Eng., Vol. 22, No. 12, pp. 1879-1896, (1998)  
[http://dx.doi.org/10.1016/S0098-1354\(98\)00239-7](http://dx.doi.org/10.1016/S0098-1354(98)00239-7)

- (33) **SUPERVISORY CONTROL OF A SELECTIVE CATALYTIC REACTOR FOR NO<sub>x</sub> REMOVAL IN INCINERATION PLANTS**  
M. Rovaglio, D. Manca, F. Rusconi  
Waste Management, Vol. 18, pp. 525-538, (1998)  
[http://dx.doi.org/10.1016/S0956-053X\(98\)00138-X](http://dx.doi.org/10.1016/S0956-053X(98)00138-X)
- (36) **MODEL PREDICTIVE CONTROL OF A STEAM REFORMING UNIT BY NEURAL NETWORKS IDENTIFICATION**  
D. Manca, E. Bonanomi, F. Ciapparelli, M. Rovaglio  
ICheaP-4, Florence, 2-5 May, pp. 171-174, (1999)
- (37) **DIRECT MODEL PREDICTIVE CONTROL OF AN INTEGRATED GASIFICATION COMBINED CYCLE PROCESS**  
M. Rovaglio, F. Rusconi, D. Manca  
ICheaP-4, Florence, 2-5 May, pp. 183-186, (1999)
- (39) **SUPERVISORY CONTROL OF WASTE INCINERATION PLANTS**  
M. Rovaglio, D. Manca, F. Rusconi,  
Proceedings of "Chemical Engineering Greetings to Prof. Mario Dente", ERIS, ISBN 0391-7401, Milan, pp. 331-351, (1999)
- (40) **MODEL PREDICTIVE CONTROL BY NEURAL NETWORKS IDENTIFICATION**  
D. Manca, E. Bonanomi, F. Ciapparelli, M. Rovaglio  
AIDIC Conference Series, ERIS, ISBN 0391-7401, Milan, pp. 201-210, (1999)
- (43) **MODEL PREDICTIVE CONTROL OF A DISCRETE-FED COMBUSTION PROCESS**  
M. Rovaglio, D. Manca, L. Borsini, P. Manzoni  
Proceedings of ICheaP-5, **1**, 553, Florence, (2001)
- (44) **MODEL PREDICTIVE CONTROL BY NEURAL NETWORKS MODELING: A COMPARISON BETWEEN LINEAR AND NON-LINEAR APPROACH**  
S. Tronci, R. Baratti, D. Manca, M. Rovaglio  
Proceedings of ICheaP-5, **1**, 535, Florence, (2001)
- (45) **MULTISTABILITY AND ROBUST CONTROL OF THE AMMONIA SYNTHESIS LOOP**  
M. Rovaglio, D. Manca, F. Cortese, P. Mussone  
Escape 11, 723-730, Elsevier, ISBN 0-444-50709-4, Denmark 27-30 May, (2001)  
[http://dx.doi.org/10.1016/S1570-7946\(01\)80115-2](http://dx.doi.org/10.1016/S1570-7946(01)80115-2)
- (47) **MULTIVARIABLE CONTROL OF HETEROGENEOUS COMBUSTION PROCESSES BY USING THERMOGRAPHY AS INFERENCE TOOL**  
M. Rovaglio, D. Manca  
Proceedings of Combustion and the Environment, I.32, S. Margherita Ligure, (2001)
- (54) **INFRARED THERMOGRAPHIC IMAGE PROCESSING FOR THE OPERATION AND CONTROL OF HETEROGENEOUS COMBUSTION CHAMBERS**  
D. Manca, M. Rovaglio  
Combustion and Flame, **130**, 4, 277-297, (2002)  
[http://dx.doi.org/10.1016/S0010-2180\(02\)00372-3](http://dx.doi.org/10.1016/S0010-2180(02)00372-3)
- (64) **A RELIABLE CONTROL FOR THE AMMONIA LOOP FACING LIMIT-CYCLE AND SNOWBALL EFFECTS**  
M. Rovaglio, D. Manca, F. Cortese  
AIChE Journal, **50**, (6), 1229-1241, (2004)  
<http://dx.doi.org/10.1002/aic.10103>
- (67) **DYNAMIC MODELING OF A POLY(ETHYLENE TEREPHTHALATE) SOLID-STATE POLYMERIZATION REACTOR II: MODEL PREDICTIVE CONTROL**  
M. Rovaglio, C. Algeri, and D. Manca  
Ind. Eng. Chem. Res., **43**, 4267-4277, (2004)

- (68) **MODELLING OF METHANOL SYNTHESIS IN A NETWORK OF FORCED UNSTEADY-STATE RING REACTORS BY ARTIFICIAL NEURAL NETWORKS FOR CONTROL PURPOSES**  
D. Fissore, A. A. Barresi, D. Manca  
Chem. Eng. Sci., **59**, 4033 – 4041, (2004)  
<http://dx.doi.org/10.1016/j.ces.2004.05.033>
- (73) **ANALYSIS, DYNAMICS AND CONTROL OF FORCED UNSTEADY-STATE REACTORS: RECENT ADVANCES**  
P. Altimari, G. Baldi, A. Barresi, G. Buzzi Ferraris, G. Continillo, S. Crescitelli, D. Fissore, D. Manca, E. Mancusi, M. Perego, L. Russo, J. Smula  
"Nuove Frontiere di Applicazione delle Metodologie dell'ingegneria Chimica" Convegno GRICU 2004 Porto d'Ischia (Napoli) 12-15 Settembre 2004, 1371-1378, ISBN: 88-87030-80-4, (2004)
- (79) **ANN IDENTIFICATION OF A FORCED UNSTEADY STATE NETWORK OF REACTORS FOR CONTROL PURPOSES**  
D. Manca, E. Roccaro  
Chemical Engineering Transactions, **6**, 143-148, (2005)
- (99) **ADVANCES IN PLANT-WIDE DESIGN AND CONTROL BY PROCESS DYNAMIC SIMULATION**  
F. Manenti, D. Manca  
Second place winner "Excellence in Simulation", University Grant Program Simsci-Esscor (Invensys Process Systems), 23-40, Ed. C. Hastings, Lake Forest, CA, USA, (2007)
- (160) **SPYRO IN DCS**  
S. Pierucci, M. Romagnoli, D. Manca, F. Manenti, S. Bruna  
Pyrotech Symposium on Spyro Program, pp. 2.1-24, Houston, April 5, (2012)