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**Ali Kemal Unver\*** (aunver@asu.edu), Department of Mathematics and Statistics, Arizona State University, P.O. Box 871804, Tempe, AZ 85287-1804. *Observation Based PDE Models for Stochastic Production Systems*. Preliminary report.

Fast methodologies for predicting complex re - entrant manufacturing systems and supply chains are developed. The basic idea underlying the approach is to extract transport coefficients for fluid dynamic models in a multi-scale setting simultaneously from Monte Carlo simulations and actual observations of the physical system (i.e. the factory). The work carries the promise to create an almost universally applicable tool to provide rough estimates of the behavior of complex production systems in non - equilibrium regimes. (Received September 16, 2008)