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Bill Kalies* (wkalies@fau.edu), Department of Mathematical Sciences, Florida Atlantic University, 777 Glades RD, Boca Raton, FL 33431. *Computing Global Dynamics of Multiparameter Systems.*

A generally applicable method for the computation of a database of global dynamics of a multiparameter dynamical system is introduced. An outer approximation of the dynamics for each subset of the parameter range is computed using rigorous numerical methods and is represented by means of a directed graph. The dynamics is then decomposed into the recurrent and gradient-like parts by fast combinatorial algorithms and is classified via Morse decompositions. These Morse decompositions are compared at adjacent parameter sets via continuation to detect possible changes in the dynamics. The method is illustrated with an application to the two-dimensional, density-dependent, Leslie population model. If time permits we will describe ongoing work to extend these ideas to time series analysis and infinite-dimensional systems. (Received March 30, 2010)