Ayudas Fundación BBVA a Investigadores, Innovadores y Creadores Culturales

Mathematical Methods for Ecology and Industrial Management

Seminar

Monday, December 7, 2015, 14h00
ICMAT, Aula Gris II

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Old Dominion University, Norfolk, USA

Computing Generating Series for Interconnected Analytic Nonlinear Systems

Abstract: A useful representation of an input-output system in nonlinear control theory is the Chen-Fliess functional series or Fliess operator. This is a weighted sum of iterated integrals, which is often manipulated algebraically in terms of a formal power series over a finite set of noncommuting variables. Interconnections of such systems induce various products of formal power series. In this talk, the main components of the Mathematica software package NonCommutative Formal Power Series (NCFPS), which is being developed to handle such product computations, will be described. Of particular interest is the feedback connection, whose generating series requires computing the antipode of a connected graded Hopf algebra. Recent advances in performing this calculation will be presented.