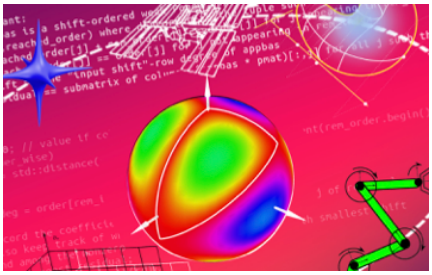

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Positive solutions to polynomial systems and applications to reaction networks by Elisenda Feliu

mardi 17 octobre 2023 11:00 (1 heure)

Abstract. The main object of study in the (algebraic) theory of reaction networks is the solution se of a system of parametric polynomial equations in the positive orthant. This system consists of polynomials with fixed support, the coefficients are linear in the parameters, but there might be some (proportionality) dependencies among the coefficients. The questions of interest concern properties of this system, and of its intersection with a family of parallel linear subspaces of complementary dimension. In this case, of relevance is to determine the possible number of zeros the system has when the parameters vary. In this talk I will introduce the framework and the families of polynomial systems under study in full generality, and having the reaction networks as the main application. I will proceed to discuss recent results addressing the expected dimension of the solution sets and on how to decide whether the solution set admits a toric parametrization for all parameter values. The latter is relevant for the problem of counting solutions, and this connection will also be explained in the talk.