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On the multiplicity of isolated roots of sparse polynomial systems.

Abstract: A generic sparse polynomial system consists of polynomial equations with a prescribed monomial structure and generic complex coefficients. The supports of the polynomials in the system (that is, the set of exponent vectors of the monomials appearing in each polynomial) play a key role in estimating the number of isolated zeros of the system and in characterizing the presence of affine positive dimensional components in the solution set over the complex numbers.

In this talk we will address the problem of determining the multiplicity of an isolated affine solution of a generic sparse polynomial system with the same number of equations as unknowns. We will show that this multiplicity depends only on the supports of the equations. Moreover, we will discuss how to compute multiplicities effectively in terms of mixed volumes of convex sets associated to the supports.

This is a joint work with Mara Isabel Herrero and Juan Sabia (Universidad de Buenos Aires and CONICET, Argentina).