SEMINARIO DI GEOMETRIA E ALGEBRA

UNIBA - POLIBA

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The Bourbaki degree of a plane projective curve

Abstract. Bourbaki sequences and Bourbaki ideals have been studied by several authors since its inception sixty years ago circa. Generic Bourbaki sequences have been thoroughly examined by the senior author with Ulrich and Vasconcelos, but due to their nature, no numerical invariant was immediately available.

The present work introduces the Bourbaki degree as the algebraic multiplicity of a Bourbaki ideal corresponding to choices of minimal generators of minimal degree of the given graded module. Since the main intent is a study of plane curve singularities via this new numerical invariant, accordingly, quite naturally, the focus is on the case where the standing graded module is the first syzygy module of the gradient ideal of a reduced form $f \in k[x,y,z]$ - i.e. the main component of the module of logarithmic derivations of the corresponding curve. The overall goal of this project is to allow for a tiny facet of classification of projective plane curves based on the behavior of this new numerical invariant, with emphasis on results about its lower and upper bounds. In particular, we revisit results of du Plessis and Wall, and of Dimca and co-authors.

(Joint work with Marcos Jardim and Abbas N. Nejad)

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