BETTI DIAGRAMS

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ABSTRACT. Given a system of equations, it can be extremely difficult to analyze its qualitative properties, such as the geometry of the corresponding variety. The theory of syzygies offers a microscope for looking at systems of equations, and helps to make their subtle properties visible.

The coefficients of the Hilbert polynomial form the fundamental numerical invariants of a graded module. The graded Betti numbers are finer numerical invariants! In fact the numerical invariants associated to free resolutions suffice to describe Hilbert functions, but the numerical invariants of minimal free resolutions contain more information. Since we will be dealing with them a lot, a compact way to display them has been introduced, called a Betti diagram. This way we encode the Betti numbers in a table.

The aim of this talk is to give an insight to this diagram and the related invariant Castelnuovou-Mumford regularity and introduce some research aspects of them.

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