

Seminari de Geometria Algebraica 2014/2015 (UB-UPC)

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Degree bounds for syzygies of rings of invariants

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125 years ago, David Hilbert proved that rings of invariants of a polynomial ring under the linear action of a finite group are finitely generated, and 100 years ago Emmy Noether provided a bound for the degrees of generators of the algebra of invariants, over a field of characteristic zero.

In 2000, this bound was extended to the case of a group of order prime to the characteristic of the field, and in 2004 Derksen proved a bound on the degrees of first syzygies of the algebra of invariants. He then conjectured a natural extension of his bound to higher syzygies.

In the joint work with Peter Symonds that I will present, we show that Derksen's conjecture doesn't hold, but we prove a slightly weaker estimate. This follows from general estimates on the homology of complexes and on Tor groups that could find other applications.
