DEGREES OF NOETHER-LEFSCHETZ LOCI

Noether-Lefschetz theorem asserts that a very general surface of degree at least four in $\mathbb{P}^3$ contains no curves other than its intersections with surfaces.

Let W be some Hilbert scheme component of curves in $\mathbb{P}^3$. Denote by $NL(W,d)$ the subset of $\mathbb{P}^N = |\mathcal{O}_{\mathbb{P}^3}(d)|$ defined by the requirement that the surface contain some member of W.

Our purpose is to address the question of determining the degree of $NL(W,d)$ for a few special families, starting from the elementary cases of lines and conics, to twisted cubics and elliptic quartic curves in $\mathbb{P}^3$.

We follow the strategy of using Bott's formula as explained in [4]. We show there are polynomial formulas valid for $d >> 0$.

This is based on work in collaboration with Adriana Rodrigues, Angelo Felice Lopez, Fernando Cukierman, Fernando Xavier and José Alberto Maia.

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