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Georg Hein, Herbert Kurke: Restricted Tangent Bundle of Space Curves

Abstract: The classification of space curves, i.e. embeddings of compact Riemann surfaces into $\mathbb{P}^3(\mathbb{C})$ is an old problem in algebraic geometry. In this paper the problem is studied under the point of view: What is the structure of the restriction of the tangent bundle of p^3 to the curve ? To be precise, we ask for the Harder-Narasimhan-polygon of the restricted tangent bundle. We show that variety of space curves has a finite stratification by locally closed subschemas, compute the expected dimension of the strata for curves of high degree (compared to the genus) and we show that in the variety of space curves of genus $g \geq 1$ and degree $d \geq g + 3$ there always exists a dense open stratum corresponding to semistable restricted tangent bundles.