

Quot schemes and varieties of commuting matrices

jeudi 11 mai 2023 11:00 (1 heure)

Let $C_n(M_d)$ denote the affine variety of all n -tuples of commuting $d \times d$ matrices. The ADHM construction relates these varieties to Quot schemes, and in particular to Hilbert schemes. On the more applied side, varieties $C_n(M_d)$ are directly connected to the question whether a tensor has minimal border rank. Although $C_n(M_d)$ is usually reducible for $n > 2$ and $d > 3$, very few irreducible components are known. In the talk we classify irreducible components for small d and all n . Moreover, we show that $C_n(M_d)$, viewed as a scheme defined by the quadratic commutativity relations, has generically nonreduced components whenever $d \geq 8$ and $n \geq 4$, while it is generically reduced for $d \leq 7$. Our results give the corresponding results for Quot schemes of points. In particular, the Quot scheme parametrizing degree 8 quotients of a free module of rank 4 over polynomial ring in 4 variables has a generically nonreduced component.

This is joint work with Joachim Jelisiejew.

Orateur: SIVIC, Klemen (University of Ljubljana)