

On commuting nilpotent matrices

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In the last two decades various results on algebraic varieties of nilpotent commuting matrices were obtained. We will present some of them. For instance, Roberta Basili showed in 2003 that the nilpotent commutator of a nilpotent matrix, call it A , is an irreducible variety. This implies that intersection with a nilpotent orbit is open and dense. Can we describe this orbit? I. e., how is the Jordan structure of this nilpotent orbit related to the Jordan structure of A ? We will present some results and a few open questions involving connections between the geometry and combinatorics of commuting nilpotent matrices. The talk will be aimed at a general audience.