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Rational Points On Linear Algebraic Groups

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In 1984, Oesterlé proved that a wound unipotent group of dimension strictly less than $p-1$ over a global function field of characteristic p has only finitely many rational points. The bound $p-1$ is sharp, as one can construct wound unipotent groups of dimension $p-1$ which are unirational and therefore have Zariski dense sets of rational points. Oesterle posed the natural question: Must a wound unipotent group over a global function field which admits infinitely many rational points admit a nontrivial unirational subgroup? One can of course formulate the question for arbitrary linear algebraic groups (though the wound unipotent case turns out to be the crucial one).

In this talk, I will discuss a proof of the affirmative answer to Oesterlé's question (in this slightly greater generality).

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