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Singularities of G -saturation.

Let G be a semisimple algebraic group defined over an algebraically closed field. In this talk, we introduce some criteria for normality and rational singularities of G -saturation under certain circumstances. Our results are applied to determine when the commuting variety over a simple Lie algebra of low rank is normal and Cohen-Macaulay. We also present some connections between injective modules and normality (resp. rational singularities) of their G -saturation. Finally, we generalize a machinery used to study singularities of nilpotent orbit closures. (Received September 20, 2021)