

PBW degenerated Demazure modules and Schubert varieties: posets and polytopes

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Resumo

I will introduce the PBW filtration on cyclic modules for nilpotent complex Lie algebras. The associated graded modules are modules for abelianized versions of the Lie algebras and of some polynomial rings. The first natural question is to ask for monomial bases of these graded modules and I will report here on the state of art, for example on polytopes parametrizing bases. By considering the corresponding flag varieties, one obtains PBW-degenerations and further toric degenerations. I will explain how these degenerations are related to the well-known degenerations in the Gelfand-Tsetlin theory via poset combinatorics. Several open questions will be presented, especially in relations to local Weyl modules of current algebras, fusion product, Schur positivity conjectures.