
THE WEIZMANN INSTITUTE OF SCIENCE
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE
Algebraic Geometry and Representation Theory Seminar

Room 155 ,Ziskind Building
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Translation Functors of Categories \mathcal{O} for Root-Reductive Lie Algebras

Abstract:

Root-reductive Lie algebras form a special type of reasonably well behaved infinite-dimensional Lie algebras. In this talk, we shall define a version of Bernstein-Gelfand-Gelfand categories \mathcal{O} for root-reductive Lie algebras, which we called extended categories \mathcal{O} and briefly discuss some properties of these categories. Let \mathfrak{g} be a rootreductive Lie algebra containing a splitting Borel subalgebra \mathfrak{b} satisfying a special additional condition called the Dynkin condition. The extended category \mathcal{O} corresponding to \mathfrak{g} and \mathfrak{b} is denoted by $\mathcal{O}\text{-bar}$.

The category $\mathcal{O}\text{-bar}$ can be decomposed analogously to the finite-dimensional cases into blocks. The main object of this talk is to give a construction of translation functors of $\mathcal{O}\text{-bar}$. Then we shall see that some objects such as tilting modules arise by applying the translation functors to Verma modules just as in the finite-dimensional cases. Furthermore, the translation functors establish equivalences between some blocks of the category $\mathcal{O}\text{-bar}$.