TAYLOR SPECTRUM FOR MODULE OVER LIE ALGEBRA

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1. Introduction

2. Preliminaries

3. Taylor spectrum of $\mathfrak{g}$-module

Let $\mathfrak{g}$ be an arbitary Lie algebra and E be a left $\mathfrak{g}$-module. We will denote by $\hat{\mathfrak{g}}$ the set of isomorphism classes of simple finite dimensional $\mathfrak{g}$-modules.

Definition 1. *The Taylor spectrum of E is the set, defined as*
$$\sigma(E) = \{V \in \hat{\mathfrak{g}} \mid \exists k \colon \operatorname{Tor}_k^{U\mathfrak{g}}(V^*, E) \neq 0\}.$$

From it follows, that the definition above coincides with the original Taylor's definition in [Add ref] case of abelian $\mathfrak{g}$.

4. Case of semisimple Lie algebra

5. Spectrum of one-dimensional extensions

6. Case of solvable Lie algebra

7. Case of nilpotent Lie algebra

8. Case of borel subalgebra of semisimple Lie algebra