

**ANGELIKA WELTE**  
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*Non-commutative coordinates for universal central extensions*

Lie algebras are non-commutative and non-associative algebraic structures which play an important role in geometry, algebra and mathematical physics. In the classical theory outstandingly nice results have been proven for the special linear Lie algebras  $sl_n(\mathbb{C})$  and their representations. Most importantly for our work there are: Homological algebra and Whitehead's Lemmas, presentations and Serre's Theorem, combinatorics and root systems. We will explain how those results can be reformulated for special linear Lie algebras with coordinates in a non-commutative or non-associative algebra  $\mathcal{A}$ . Our approach reveals again an interesting connection between properties of the coordinate algebra, homological data of the Lie algebra and also combinatorial properties of the root system. It turns out that not only the Lie algebra, but also its universal central extension can be coordinatized by  $\mathcal{A}$ .