THE FIELDS INSTITUTE
FOR RESEARCH IN MATHEMATICAL SCIENCES

ABSTRACTS 1.2

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Selfinjective Koszul algebras of finite complexity (50-60)

We study selfinjective Koszul algebras of finite complexity. We show that these are graded selfinjective algebras whose Loewy matrices having spectral radii 1. We also prove that their complexities are nonnegative integers and the category $\mathcal{C}_t$, of the modules with complexity less or equal to t, is resolving and coresolving for all t. Typycal example of selfinjective algebra of finite complexity m is the skew group algebras of a finite subgroup G of $\mathrm{SL}(m, \mathbf{C})$ over the exterior algebra of a m dimensional vector space. Such algebra has the McKay quiver of G as its quiver. We prove that for such algebra for each $0 \leq t \leq m$ there exist a family of modules of complexity t parametrized by $G(t, m)$, the Grassmannian of t-dimensional subspaces of an m-dimensional vector space. The can be regarded as a (partial) generalization of the one parameter family of tubes of the regular modules in tame algebras with vanishing radical cube. Using complexity, we also give a new approach to the representation theory of a tame symmetric algebra with vanishing radical cube over an algebraically closed field of characteristic 0. We remark that this is also a new approach of the representation theory of the hereditary algebras given by a bipartete quiver.