

Representations of monomial algebras have poly-exponential complexities

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We use directed graphs called "syzygy quivers" to study the asymptotic growth rates of the dimensions of the syzygies of representations of finite dimensional algebras. For any finitely generated representation of a monomial algebra, we show that this growth rate is poly-exponential, i.e. the product of a polynomial and an exponential function, and give a procedure for computing the corresponding degree and base from a syzygy quiver. We characterize the growth rates arising in this context: The bases of the occurring exponential functions are the real, nonnegative algebraic integers b whose irreducible polynomial over \mathbb{Q} has no root with modulus larger than b . Moreover, we show that these growth rates are invariant under stable derived equivalences.

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