

Primitively generated Hall algebras

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In the present talk we discuss two important properties of Hall algebras of finitary exact categories. First, they are spanned as vector spaces by ordered (with respect to any total order) monomials on indecomposables in the category and are therefore sub-Poincaré-Birkhoff-Witt algebras. Second, if the graded subspaces in the Hall algebra are finite dimensional with respect to the natural grading by the Grothendieck monoid, the Hall algebra is generated by its primitive elements even if the multiplication and the comultiplication are not compatible. As a special case, we obtain a generalization of a result of van den Bergh and Sevenhant, namely that the Hall algebra of a hereditary abelian category is a Nichols algebra.

Based on joint work with A. Berenstein.

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