

iHall algebras of weighted projective lines and iquantum loop algebras

The iHall algebra of a weighted projective line is defined to be the semi-derived Ringel-Hall algebra of the category of 1-periodic complexes of coherent sheaves on the weighted projective line over a finite field. We show that this Hall algebra provides a realization of the iquantum loop algebra, which is a generalization of the quantum group arising from the quantum symmetric pair of split affine type ADE in its Drinfeld type presentation. The iHall algebra of the iquiver algebra of split affine type A was known earlier to realize the same algebra in its Serre presentation. We then establish a derived equivalence which induces an isomorphism of these two iHall algebras, explaining the isomorphism of the quantum group of split affine type A under the two presentations.

This is joint work with Ming Lu.