Abstract

Inspired by Caldero-Keller's discovery of the similarity between the multiplication formulas in a cluster algebra and that in a (dual) Hall algebra, we firstly discuss an algebra homomorphism from the dual Hall algebra associated to Rep(Q) (category of representations of an acyclic quiver Q) to the corresponding quantum cluster algebra. Then we address the connection from two certain quotients of subalgebras of the derived Hall algebras of Rep(Q) to acyclic quantum cluster algebra. Finally, we give cluster multiplication formulas via the above derived Hall algebras. This talk is based on the joint works with Ming Ding and Fan Xu, and with Ming Ding and Haicheng Zhang respectively.