A GENERALISED MCKAY CORRESPONDENCE FOR FUSION CATEGORIES

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Abstract:

The McKay correspondence gives bijection between the finite subgroups G of $SU(2)$ and the affine ADE graphs (quivers), obtained by taking the McKay quiver of the finite subgroup G with respect to tensoring by the standard representation V. While in general we can't say much about the McKay quiver for finite groups, Auslander–Reiten reveal a beautiful classification of their separated McKay quivers instead: they show that the separated McKay quiver of any finite group G with respect to tensoring by a representation V is a (disjoint union of) affine ADE quiver if and only if the dimension of V is 2. In the quantum setting, there is also a quantum analog of the McKay correspondence given by the result of Kirillov–Ostrik. In this setting, we have instead a bijection between the (non-affine) ADE graphs and the (indecomposable) semisimple module categories M of fusion categories C associated to quantum $SU(2)$ at roots of unity. As in the classical setting, the bijection is given by taking the McKay quiver of M with respect to tensoring by the generating object V of C. The aim of this talk is to introduce the generalisation of this result following the insight of Auslander–Reiten. Namely, for any fusion category C and any of its semisimple module category M, we will see that the separated McKay quiver of M with respect to tensoring by an object V of C is a (disjoint union of) ADE quiver if and only if the Frobenius–Perron dimension of V is less than 2. This is a joint work with Ben Elias.