

NON-ADE TYPE BRAID GROUP ACTIONS FOR CREPANT RESOLUTIONS OF 3-FOLD CYCLIC QUOTIENT SINGULARITIES

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Abstract:

Spherical objects and spherical twists provide a fundamental connection between braid groups and autoequivalences of derived categories. While ADE type braid group actions are relatively well understood, much less is known for general non-ADE quivers with potential, especially concerning faithfulness. This project studies such actions on crepant resolutions of 3-fold cyclic quotient singularities. Using toric geometry and the derived McKay correspondence, we construct spherical objects supported on exceptional surfaces and investigate the resulting (Q,W)-configurations and braid group actions. Building on our previous results for examples related to ADE types via spherical twists or quiver mutation, we focus on genuinely non-ADE cases. The main goals are to study the compatibility between (Q,W)-configurations and quiver mutation, and to establish faithfulness of the associated braid group actions using categorical methods, including tilting and Bridgeland stability conditions.