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*Categorical  $\mathfrak{sl}(2)$  actions and equivalences of categories*

Actions of the Lie algebra  $\mathfrak{sl}(2)$  on vector spaces arise naturally in combinatorics, geometry, and algebra. Such an action consists of a sequence of vector spaces with linear maps between them satisfying certain relations.

From this perspective, one can define an action of  $\mathfrak{sl}(2)$  on a category to be a sequence of categories with functors between them satisfying certain relations. Such actions were studied by Chuang–Rouquier in the context of representations of the symmetric group in positive characteristic. More recently, Cautis, Licata, and the speaker studied an action of  $\mathfrak{sl}(2)$  where the categories involved were derived categories of coherent sheaves on cotangent bundles to Grassmannians. Following the ideas of Chuang–Rouquier, we used this  $\mathfrak{sl}(2)$  action to construct an equivalence of derived categories between different cotangent bundles of Grassmannians.