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Izuru Mori* (mori.izuru@shizuoka.ac.jp). *Noncommutative Matrix Factorizations.*

This is a report on the joint work with Kenta Ueyama. Theory of matrix factorizations is useful to study hypersurfaces in commutative algebra. To study noncommutative hypersurfaces, which are very important objects in noncommutative algebraic geometry, we introduce a notion of noncommutative matrix factorization (this was formerly defined as a twisted matrix factorization for a regular normal element by Cassidy, Conner, Kirkman and Moore). First, we show that the category of noncommutative matrix factorization is invariant under the operation called twist. Secondly, in the case of a regular normal element, we show that the stable category of noncommutative matrix factorizations is equivalent to the stable category of a certain full subcategory of the category of totally reflexive modules (this result is analogous to the famous result by Eisenbud for commutative hypersurfaces). By using this equivalence, we describe indecomposable noncommutative matrix factorizations over skew exterior algebras (which are hardly noncommutative hypersurfaces). In particular, we show that, for each natural number r , there exist infinitely many indecomposable matrix factorizations of rank r over a skew exterior algebra. (Received January 14, 2019)