SPHERELIKE DIVISORS

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Let X be a smooth projective variety of dimension d. An object S in $\mathcal{D}^b(X)$ is called *spherical* if

(1) $\mathrm{Ext}^\bullet(S,S) = \Bbbk \oplus \Bbbk[-d]$; *$d$-spherelike object*
(2) $S \otimes \omega_X \cong S$. *Calabi-Yau object*

P. Seidel and R. Thomas showed that such an S defines an autoequivalence T_S, the *spherical twist* about S. In the context of the homological mirror symmetry conjecture, they proved that T_S is dual to the Dehn twist of a symplectic manifold about a Lagrangian.

In general, the Calabi-Yau property of a spherical object will be lost under birational transformations of X. In a joint work, M. Kalck, D. Ploog and I showed how to associate to an arbitrary spherelike object F in a triangulated category $\mathcal{D}$ a unique maximal triangulated subcategory $\mathcal{D}_F$, where F becomes spherical – the *spherical subcategory* of F.

In this talk, I will give a short introduction to spherical subcategories and then will focus on the case of *spherelike divisors* D on a surface X, i.e. effective divisors such that $\mathcal{O}_D$ is spherelike. Especially, I will talk about a numerical characterisation of these divisors and to what extend they can be classified.

This is work in progress with D. Ploog.