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Correspondences acting on constant cycle curves on K3 surfaces

Friday, 27 September 2024 09:00 (1 hour)

Constant cycle curves on a K3 surface X are curves whose points all define the Beauville-Voisin class in the Chow group of X. They were first considered by Huybrechts and Voisin as a generalization of the notion of rational curve, which is still not fully understood. In this talk, we introduce correspondences $Z \subseteq X \times X$ over $\mathbb{C}$ acting on constant cycle curves, and we study geometric examples that can potentially improve our current understanding. More precisely, for a general primitively polarised K3 surface (X, H) of genus $p \geq 2$, we consider for any $k \geq 2$ and any $0 \leq \delta \leq p$ the locus $Z_{k,\delta}(X, H) \subseteq X \times X$ of pairs of points (p, q) contained in some δ-nodal curve C with the property that $p - q$ is k-torsion in the Jacobian of the normalization of C. We prove that this locus is not empty of the expected dimension 2 if and only if a certain Brill-Noether number is non negative, and that, when not empty, it gives the desired examples. This is part of a work in progress with Andreas Knutsen.

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