

1096-14-75

Mihai Fulger* (afulger@princeton.edu), **Brian Lehmann**, **Xiaolei Zhao** and **Zhixian Zhu**.
Pseudo-effective numerical classes with vanishing pushforward.

In a recent paper, Debarre, Jiang, and Voisin propose a series of conjectures that state that the vanishing of a limit of effective (co)homological classes via a push-forward map should be visible geometrically.

We are interested in the numerical version of this statement. For an arbitrary projective variety over an algebraically closed field K , the pseudo-effective cone $Eff_k(X)$ is the closure of the cone of classes of effective cycles of dimension k in the numerical group $N_k(X)$ with real coefficients.

If $\pi : Y \rightarrow X$ is a morphism of projective varieties and $\alpha \in Eff_k(Y)$ satisfies $\pi_*\alpha = 0$, the conjecture is that α is a limit of classes of effective cycles that are contracted by π to cycles of smaller dimension. A weaker form of the conjecture states that α is a linear combination with possibly negative coefficients of classes of effective contracted cycles.

We prove the strong form of the conjecture for divisors, curves, and when π is a birational morphism of four-folds. This generalizes and extends the results of Debarre, Jiang, and Voisin.

We also prove the weak form of the conjecture for vector bundle maps, and for birational morphisms over a complex projective manifold. (Received July 12, 2013)