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The Hodge rank of ACM bundles and Franchetta's conjecture

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Abstract. We prove that on a general hypersurface in $\mathbb{P}^N$ of degree d and dimension at least 2, if an arithmetically Cohen-Macaulay (ACM) bundle E and its dual have small regularity, then any nontrivial Hodge class in $\mathrm{H}^n(X,\ E \otimes \Omega^n_X)$, with $n = \lfloor \frac{\dim X}{2} \rfloor$, produces a trivial direct summand of E. As a consequence, we prove that there is no universal Ulrich bundle on the family of smooth hypersurfaces of degree $d \geq 3$ and dimension at least 4. This last result may be viewed as a Franchetta-type statement for Ulrich bundles on smooth hypersurfaces.

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