

On the distribution of the Hodge locus

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Given a polarizable variation of Hodge structures on a smooth complex quasi-projective variety S (e.g. the one associated to a family of pure motives over S), Cattani, Deligne and Kaplan proved that its Hodge locus (the locus of closed points of S where exceptional Hodge tensors appear) is a *countable* union of closed algebraic subvarieties of S . In this mini-course I will discuss when this Hodge locus is actually algebraic. By dividing the Hodge locus in its typical and atypical part, one can indeed predict its distribution. Various concrete applications/examples will also be discussed.