Hodge Structures, Tate Twists, and Abelian Varieties

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Abstract

The general Hodge conjecture (à la Grothendieck) is equivalent to the usual Hodge conjecture together with the statement that a motive (over $\mathbf{C}$) is effective if and only if its Hodge realization is effective. With this motivat ion, I shall discuss the following question: Let M be a Hodge structure arisin g in the cohomology of an abelian variety over $\mathbf{C}$. If the Tate twist $M(1)$ is effective, then does $M(1)$ occur in the cohomology of some abelian variety?