Variation of the motive of the moduli of bundles over a curve

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Abstract

This is going to be a report on some work (in progress) with Aji Dhillon. Let M(C) be the moduli space or stack of vector bundles or (hopefully by June) principal G-bundles over a complex smooth curve projective C. The basic goal is to understand the (suitably defined) motive of M(C) for a fixed or variable curve. Where "variable curve" really means that we consider the relative motive of the moduli of bundles over the universal curve over M_g. Among the things we can prove is that the motive of M(C) lies in the tensor category generated by C. Passing to the Hodge realization yields some nontrivial information about the variation of Hodge structure associated to M(C). For instance that the monodromy representation for M(C) is trivial on the Torelli group.