

Arithmetic of degenerating principal variations of Hodge structure:
examples arising from mirror symmetry and middle convolution
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Abstract. We collect evidence in support of a conjecture of Griffiths, Green and Kerr on the arithmetic of extension classes of limiting mixed Hodge structures arising from semistable degenerations over a number field. After briefly summarizing how a result of Iritani implies this conjecture for a collection of hypergeometric Calabi-Yau threefold examples studied by Doran and Morgan, the authors investigate a sequence of (non-hypergeometric) examples in dimensions $1 \leq d \leq 6$ arising from Katz's theory of the middle convolution. A crucial role is played by the Mumford-Tate group (which is G_2) of the family of 6-folds, and the theory of boundary components of Mumford-Tate domains.