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The Hodge-Tate sequence and overconvergent $p$-adic modular sheaves

Using Faltings’ theory of the Hodge-Tate sequence of an abelian scheme we give a functorial construction of “modular sheaves” $\Omega^\kappa$, where $\kappa$ is a not-necessarily integral weight, attached to abelian schemes on which the canonical subgroup exists. These sheaves generalize the integral powers, $\omega^k$, of the sheaf $\omega$ of relative differentials on a modular curve. Global sections of $\Omega^\kappa$ provide geometric realizations of overconvergent automorphic forms of non-integral weight. Applications of this approach to the theory of $p$-adic Hilbert modular forms will be described. This is joint work with Fabrizio Andreotti and Adrian Iovita.