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p-arithmetic and completed cohomology of quaternionic Shimura varieties

In this report on joint work with Samit Dasgupta, I will describe a relationship between classes in the cohomology of $\mathfrak{p}$-arithmetic groups and intertwining operators between smooth or p-adic representations of $GL_2(F_{\mathfrak{p}})$, F a totally real field, and classical or completed cohomology groups of $\mathfrak{p}$-towers of quaternionic Shimura varieties over F. This relationship can be used generalize some results of Breuil and Emerton concerning L-invariants and p-adic L-functions to the setting of Hilbert modular forms.