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*Derivatives of Hida families and rigid meromorphic cocycles*

A rigid meromorphic cocycle is a class in the first cohomology of the group  $SL_2(\mathbb{Z}[1/p])$  acting on the non-zero rigid meromorphic functions on the Drinfeld  $p$ -adic upper half plane by Möbius transformation. Rigid meromorphic cocycles can be evaluated at points of real multiplication, and their values conjecturally lie in the ring class field of real quadratic fields, suggesting striking analogies with the classical theory of complex multiplication.

In this talk, we discuss the relation between the derivatives of certain  $p$ -adic families of Hilbert modular forms and rigid meromorphic cocycles. We explain how the study of congruences between cuspidal and Eisenstein families allows us to show the algebraicity of the values of a certain rigid meromorphic cocycle at real multiplication points.

This is joint work with Henri Darmon and Jan Vonk.