

Arithmetic intersection theory and unitary Shimura varieties

Ben Howard

Conjectures of Kudla predict that the intersection multiplicities of special cycles on integral models of orthogonal and unitary Shimura varieties should agree with the Fourier coefficients of derivatives of Eisenstein series. The simplest case of this is found in the paper “On the derivative of an Eisenstein series of weight one” by Kudla-Rapoport-Yang, where the Fourier coefficients of an Eisenstein series are shown to agree with the degrees of certain 0-cycles on integral models of modular curves. The goal of the lectures will be to explain this 0-dimensional case, and its generalization to higher dimensional unitary Shimura varieties.

Suggested reading:

1. *On the derivative of an Eisenstein series of weight one*, by Kudla-Rapoport-Yang, Internat. Math. Res. Notices 1999, no. 7, 347385.
2. *Moduli spaces of CM elliptic curves and derivatives of Eisenstein series*. These are my notes on the above paper, from the lectures I gave at the Morningside Institute. See <https://www2.bc.edu/howardbe/Research/morningside.pdf>
3. My paper *Complex multiplication cycles and Kudla-Rapoport divisors*. See <https://www2.bc.edu/howardbe/Research/unitary.pdf>