

---

**PAVEL COUPEK**, Michigan State University

*Heights of modular forms and Eisenstein congruences*

Let  $f$  be an automorphic Hecke eigenform. The automorphic height  $H_{aut}(f)$  is defined in terms of the  $L^2$  norm of harmonic forms representing the singular cohomology group in which  $f$  is realized, while the arithmetic height  $H_{arit}(f)$  is a version of height of motives developed by Kato and Koshikawa. The height conjecture of Venkatesh predicts that  $H_{aut}(f)/H_{arit}(f)$  is related to the value of the adjoint L-function of  $f$  at  $s = 1$ .

As the arithmetic height depends on a choice of a lattice in the Galois representation of  $f$ , it is natural to ask to what extent does the quotient  $H_{aut}(f)/H_{arit}(f)$  depend on such a choice, especially in the presence of congruences between  $f$  and an Eisenstein series. I will talk about joint work in progress with Preston Wake in this direction, in the context of classical weight 2 modular forms.