1114-11-302 **Kenneth A. Ribet*** (ribet@berkeley.edu). *The Eisenstein ideal and the cuspidal group.* Preliminary report.

We present joint work with Bruce Jordan and Anthony Scholl on the Jacobian J of the modular curve $X = X_0(N)$, where N is a positive integer.

Let $\tilde{\mathbf{T}}$ be the ring of Hecke operators on the space of modular forms of weight 2 for $\Gamma_0(N)$, and let $\mathbf{T}$ be the image of $\tilde{\mathbf{T}}$ in the endomorphism ring of J. The Eisenstein ideal of $\mathbf{T}$ is the ideal of those $t \in \mathbf{T}$ that lift to an operator $\tilde{t} \in \tilde{\mathbf{T}}$ such that $\tilde{t}$ vanishes on the space of Eisenstein series.

Let C be the cuspidal subgroup of J. Because we have $I \subseteq \operatorname{Ann}_{\mathbf{T}} C$, it is natural to ask whether $I = \operatorname{Ann}_{\mathbf{T}} C$.

We prove this equality locally at prime numbers that are prime to the product $6N$ and expect to be able to consider more generally primes (including 2 and 3) whose squares do not divide N.

Let $\mathcal{C}$ be the *formal cuspidal group* for J, the group of degree-0 divisors on X with support on the cusps. There is a natural map $\mathcal{C} \to J$ whose image is C; we regard this map as a 1-motive $[\mathcal{C} \to J]$. Consideration of the cohomology of this 1-motive reveals the desired connection between the Eisenstein ideal and the cuspidal group of J. (Received September 01, 2015)