

**Number theory and Representation
Theory seminar, Fall 2007
East Hall 4096
November 19, 3:10-5:00pm
(tea break at 4pm)**

Newton integral motives over finite fields

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Abstract

Serre showed, decades ago, that there cannot be a "rational singular cohomology" (i.e., a cohomology with \mathbb{Q} -coefficients yielding the \mathbb{Q}_{ℓ} -étale cohomology when tensored) in characteristic $p > 0$: if there were, the (quaternion) endomorphism algebra of a super-singular elliptic curve would act on a two-dimensional rational vector space. Suitably assuming Tate's conjecture, however, we construct such a cohomology theory, applicable to varieties that are *ordinary* (hence avoiding Serre's examples), a condition that is believed to be generically satisfied. As an application, we give a partial and conditional answer to questions of Serre and of Katz on the Poincaré pairing on mod- ℓ cohomology groups..