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Rachel M. Davis* (rdavis@math.wisc.edu), Madison, WI 53706. *Generalizing Traces of Frobenius for Metabelian Galois Representations*. Preliminary report.

Given an elliptic curve E over \mathbb{Q} , there is an associated Galois representation to $GL_2(\mathbb{Z}')$, obtained at the finite level by considering the action of Galois on the n -torsion points of E . We are especially interested in the images of the Frobenius elements under this map. Since the images of these elements are only well-defined up to conjugacy, we are interested in conjugacy invariants such as the trace and determinant. There is a more general representation (related to the fundamental group of the elliptic curve minus a point) to the automorphism group of a free pro- ℓ group on 2 generators. Note that $GL_2(\mathbb{Z}')$ is the automorphism group of an abelian group. I consider a representation to an automorphism group of a metabelian group that reduces to the ℓ -adic representation described above. I consider possible conjugacy invariants for this larger representation. (Received August 14, 2012)