1023-11-1011 **Barry Mazur** and **Karl Rubin*** (krubin@math.uci.edu), Department of Mathematics, UC Irvine, Irvine, CA 92697. *Finding large Selmer groups over Galois extesions of number fields.*

Suppose K/k is a quadratic extension of number fields, E is an elliptic curve over k, p is an odd prime, and F is a p-extension of K, Galois over k. We prove general lower bounds for the corank of the p-power Selmer group $\mathrm{Sel}_{p^\infty}(E/F)$.

Let $G = \mathrm{Gal}(F/K)$, fix a lift c of the nontrivial automorphism of K/k to $\mathrm{Gal}(F/k)$, and let G^+ be the subgroup of G consisting of all elements that commute with c. If the corank of $\mathrm{Sel}_{p^\infty}(E/K)$ is odd, then under mild hypotheses we prove that the corank of $\mathrm{Sel}_{p^\infty}(E/F)$ is at least $[G : G^+]$.

If $k = \mathbf{Q}$, K is imaginary quadratic, and F is an anticyclotomic extension, then G^+ is trivial, so $[G : G^+] = [F : K]$, and the lower bound for the Selmer corank was already known, by an explicit construction of Heegner points. Except in such special cases, the source of the Selmer classes in $\mathrm{Sel}_{p^\infty}(E/F)$ is very mysterious. The case where F is $\mathbf{Q}(E[p^n])$ is particularly interesting for nonabelian Iwasawa theory. (Received September 24, 2006)