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Fake Selmer sets of curves

We consider the problem of determining if a curve has any rational points. A first step in deciding this is to see if the curve has points everywhere locally. This is a necessary, but not sufficient condition for having rational points.

A refined criterion is obtained by considering an unramified Galois cover of the curve. If the curve has a rational point, then one of finitely many twists of the cover has a rational point as well, and hence there must be a twist that has point everywhere locally. This method is referred to as a *finite descent* on the curve, and the collection of everywhere locally solvable covers is called a *Selmer set* of the curve.

We present a method that computes an object that is closely related to the Selmer set, but is much easier to compute. We also present some statistics on the effectiveness of this descent obstruction compared to local obstructions.