Ronald M. van Luijk* (rmluijk@math.berkeley.edu) and Adam M. Logan. Toward an explicit 2-descent on the Jacobian of a generic curve of genus 2. Preliminary report.

Let $C$ be a curve of genus 2 over a number field $K$ and $J$ its Jacobian. A 2-descent on $J$ requires that we decide whether a given twist $J'$ of $J$ has a rational point over $K$. These twists are not easy to deal with as they are described by 72 quadrics in $\mathbb{P}^{15}$. The corresponding twists of the Kummer surface and its dual $X$ associated to $J$ are easier to handle. A twist $X'$ of $X$ can be embedded as the complete intersection of three quadrics in $\mathbb{P}^5$ and such an $X'$ contains 32 lines. Generically these lines generate the Picard group of $X'$. The Galois action on the lines allows us to compute the algebraic Brauer group of $X'$. The elements of this group describe the Brauer-Manin obstructions to the existence of rational points. (Received September 27, 2005)