Abbey Bourdon* (abourdon@uga.edu) and Pete L. Clark. Torsion Points on CM Elliptic Curves.

Let $F$ be a number field, and let $E/F$ be an elliptic curve with complex multiplication (CM) by an order $\mathcal{O}$ in an imaginary quadratic field $K$. We provide an explicit description of the Weber function field of $E$, classically known in the case where $\mathcal{O}$ is the full ring of integers in $K$, and we use this to prove a uniform open image theorem for $K$-CM elliptic curves whose endomorphisms are rationally defined. We apply these results to give a complete determination of the degrees of $K$-CM points on the modular curves $X_1(N)/K$ for any positive integer $N$. (Received September 20, 2016)