1046-14-800 **Emma Previato*** (ep@bu.edu), Department of Mathematics and Statistics, Boston University, Boston, MA 02215-2411, and **T. Shaska**, Department of Mathematics and Statistics, Oakland University, Rochester, MI 48309. *Thetanulls of curves with automorphisms.*

The GAP BRAID routine due to K. Magaard, S. Shpectorov and H. Völklein (*Experiment. Math.* **12** (2003)) enabled the calculation of possible automorphism groups of curves, and polynomial equations for the corresponding curves, for small genus g (K. Magaard, T. Shaska, S. Shpectorov, H. Völklein, in *Communications in arithmetic fundamental groups* (2002)). We seek an equation in terms of thetanulls for each group, defining the locus $\mathcal{M}(g, G)$ of curves with automorphism group G in the moduli space, by expressing the equation of the curve by thetanulls (Thomae's formulas). In genus 2 (joint work with T. Shaska and S. Wijesiri, *Albanian J. Math.* **1** (2007)), the formulas in part are elegantly related to classical work by Jacobi and others, in part are pages long, calculated by computer using a characterization of the loci in terms of Igusa invariants (T. Shaska, *J. Symbolic Comput. 31* (2001)). In genus 3 (joint work with T. Shaska) we succeed in special cases and we give characterizations of a curve in $\mathcal{M}(3, G)$ in terms of Jacobian splitting (up to isogeny) and elements of finite order in the Jacobian. (Received September 11, 2008)