

Meeting: 1007, Santa Barbara, California, SS 4A, Special Session on Automorphisms of Surfaces

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A compact Riemann surface of genus g that has a conformal involution with $2g + 2$ fixed points is called a hyperelliptic surface. Every surface of genus 2 is hyperelliptic. The boundary of a solid handlebody is a Riemann surface. Thus genus two handlebodies are three manifolds whose boundaries are hyperelliptic Riemann surfaces. We show that the convex core of such a three manifold is also a hyperelliptic Riemann surface. We generalize the notion of a hyperelliptic Riemann surface to a *hyperelliptic* three manifold. We show that the handlebody has a unique order two isometry fixing six unique geodesic line segments, which we call the *Weierstrass lines* of the handlebody. The Weierstrass lines are, of course, the analogue of the Weierstrass points on the boundary surface. Further, we show that the manifold is foliated by surfaces equidistant from the convex core, each fixed by the isometry of order two. The restriction of this involution to the equidistant surface fixes six *generalized Weierstrass points* on the surface. (Received February 05, 2005)