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Robert Suzzi Valli* (robert.suzzivalli@manhattan.edu). *Non-simple closed geodesics on orbifolds.*

If \mathbb{H} is the hyperbolic plane and Γ is a Fuchsian group, then the quotient $X = \mathbb{H}/\Gamma$ is an orbifold surface. In the case that Γ contains elliptic elements, their fixed points in \mathbb{H} project to cone points on X . The presence of cone points requires a finer notion of paths and homotopy on X with the goal of defining the orbifold fundamental group, $\pi_1(X, b)$, and obtaining an isomorphism between $\pi_1(X, b)$ and Γ . With this at our disposal we will study once self-intersecting closed geodesics on X which are disjoint from the cone points, called *figure eight geodesics*. Among other things, we identify the shortest figure eight geodesic on a triangle group orbifold, and then use this to find the shortest figure eight geodesic among all orbifold surfaces without cone points of order two. (Received February 02, 2016)