1023-57-553 **Joel Zablow*** (`jxzsma@rit.edu`), Dept. of Mathematics and Statistics, 85 Lomb Memorial Drive, Rochester Institute of Technology, Rochester, NY 14623. *On some relations and homology of the Dehn twist quandle.*

Given a closed orientable surface F of genus g, isotopy classes of simple closed curves (circles) in F form a quandle Q, with Dehn twisting as the operation. We show certain basic relations in the quandle. Fenn, Rourke, and Carter, Kamada, and Saito describe a homology theory for quandles. We look at the homology theory in the particular case of the Dehn twist quandle. The quandle chain and homology groups form modules over the integral group-ring $\mathbf{Z}(G)$, where G is the mapping class group of F. Transitivity properties of G with respect to certain configurations of circles allow decompositions, and a peeling off of cyclic sub-module summands in the modules $Z_n(Q)$, $H_1(Q)$ and $H_2(Q)$ and, we conjecture, in $H_n(Q)$ for all n. The conjecture holds for the homology of the related Dehn "rack". Relations in Q are shown to correspond to quandle 2-cycles and to generalized knot diagrams as in Carter, Kamada , Saito. Time allowing, we discuss some further interesting actions on certain 2-cycles and a "stabilization" homomorphism on quandle chains. This latter gives an initial (though incomplete) interpretation of what boundaries are in this theory. Finally, we suggest some connections to Lefschetz fibrations and surface bundles over circles. (Received September 17, 2006)