962-55-1006 **Frederick R. Cohen*** (cohf@math.rochester.edu), F.R. Cohen, Department of Mathematics, University of Rochester, Rochester, NY 14627. *On modular forms, and the real cohomology of mapping class groups for a punctured torus.*

Let T denote a standard torus, and let T' denote T minus the identity element. Let $B_k(T)$, and $B_k(T')$ denote the respective braid groups with k strands for these surfaces. The group $SL(2,\mathbb{Z})$ acts naturally on both surfaces, and on both braid groups. There are extensions Γ_1^k, and $\Gamma_1^{k,*}$ exemplified by $1 \to \ B_k(T') \to \ \Gamma_1^{k,*} \to \ SL(2,\mathbb{Z}) \to \ 1$. These groups admit interpretations as mapping class groups. The purpose of this talk is to describe the real cohomology of $\Gamma_1^{k,*}$ with both trivial coefficients, and coefficients in the sign representation in terms of cusp forms M_{2n}^0 (with Shimura's weight convention) in the ring of classical modular forms based on the standard $SL(2,\mathbb{Z})$-action on the upper 1/2-plane. A sample clean result with coefficients in the sign representation $\mathbb{R}(\ pm\ 1)$ is as follows:

Theorem 1 *Assume that $k \geq 2$. Then $H^i(\Gamma_1^{k,*};\mathbb{R}(\ pm\ 1)$ is isomorphic to*

1. $M_{2k+2}^0 \oplus \mathbb{R}$ *if* $k = 2k$, *and* $i = 2k+1$,
2. $M_{2k+2}^0 \oplus \mathbb{R}$ *if* $k = 2k+1$, *and* $i = 2k+1$, *and*
3. *0 otherwise.*

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