1042-55-222 **Andrew Putman*** (`andyp@math.mit.edu`), Department of Mathematics, Massachusetts Institute of Technology, 2-306, 77 Massachusetts Avenue, Cambridge, MA 02139-4307. *The second rational homology group of the moduli space of curves with level structures.*

Let Γ be a finite-index subgroup of the mapping class group of a closed genus g surface that contains the Torelli group. For instance, Γ can be the level L congruence subgroup or the spin mapping class group. We show that $H_2(\Gamma; \mathbb{Q}) = \mathbb{Q}$ for $g \geq 5$. A corollary of this is that the rational Picard groups of the associated finite covers of the moduli space of curves are also equal to $\mathbb{Q}$. We also prove analogous results for surface with punctures and boundary components. (Received August 19, 2008)