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John D. McCarthy (mccarthy@math.msu.edu), Department of Mathematics, A-228 Wells Hall, Michigan State University, East Lansing, MI 48824-1027, and **William R. Vautaw*** (wvautaw@selu.edu), Department of Mathematics, SLU 10687, Hammond, LA 70402.
Automorphisms of the complex of separating curves, and applications.

Let S be a closed, connected, oriented surface of genus $g > 2$. The complex of separating curves of S , denoted C_{sep} , is the abstract simplicial complex whose vertices are the isotopy classes of separating circles on S , and where a set of vertices form a simplex if and only if they have pairwise disjoint representatives. We prove that each simplicial automorphism of C_{sep} is induced by a homeomorphism of S . The method involves the following two steps. First, we prove that each automorphism of the “Torelli geometry”, $\mathcal{TG}(S)$, (defined recently by Farb and Ivanov) is induced by a homeomorphism of S , a result that has already been established by Farb and Ivanov for $g > 4$. Second, we prove that each automorphism of C_{sep} extends to an automorphism of $\mathcal{TG}(S)$. As applications, we prove that each isomorphism between finite index subgroups of G is induced by a homeomorphism, where G is any of the following groups: the mapping class group or Torelli group of S (previously established results) or the group K_g , the subgroup of the mapping class group generated by Dehn twists about separating circles (a new result). (Received February 20, 2004)