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**Andrew Cotton-Clay\*** (acotton@math.berkeley.edu), Department of Mathematics, Room 2-314, M.I.T., 77 Massachusetts Ave., Cambridge, MA 02139. *Symplectic Floer homology of area-preserving surface diffeomorphisms and sharp fixed point bounds.*

The symplectic Floer homology  $HF_*(\phi)$  of a symplectomorphism  $\phi$  encodes data about the fixed points of  $\phi$  using counts of holomorphic cylinders in  $\mathbb{R} \times M_\phi$ , where  $M_\phi$  is the mapping torus of  $\phi$ . We give an algorithm to compute  $HF_*(\phi)$  for  $\phi$  a surface symplectomorphism in a pseudo-Anosov or reducible mapping class, completing the computation of Seidel's  $HF_*(h)$  for  $h$  any orientation-preserving mapping class. We also show that the rank of a certain twisted version of symplectic Floer homology gives a bound on the number of fixed points of any map with nondegenerate fixed points in a given symplectic mapping class on a monotone symplectic manifold. By calculating this twisted version for surfaces we obtain a sharp lower bound on the number of fixed points of an area-preserving map (with nondegenerate fixed points) in any prescribed mapping class, generalizing the Poincaré-Birkhoff fixed point theorem. (Received January 06, 2009)