Twisting a topological phase on a lattice MENG CHENG, Microsoft
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When a two-dimensional topological phase inhabits a torus, it possesses a ground
state degeneracy robust to any local perturbations. These degenerate ground states
can transform nontrivially under modular transformations of the torus, generated
by Dehn twists. Representation of Dehn twists on the ground states characterizes
the topological order. We propose that the Dehn twists can be obtained as a non-
Abelian Berry phase of an adiabatic deformation of the lattice model. We apply
this method to the example of a $p_x + ip_y$ superconductor and provide a TQFT
interpretation of the numerical results.

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