1086-37-2652 **Kiran Parkhe*** (`kparkhe@math.northwestern.edu`), Math Department, Northwestern University, 2033 Sheridan Road, Evanston, IL 60208. *Continuous actions of the discrete Heisenberg group on surfaces.*

The (discrete) Heisenberg group is the group $H = \langle a, b, c\colon aba^{-1}b^{-1} = c, ac = ca, bc = cb\rangle$. A continuous (smooth) action of H on a manifold M is a homomorphism $\Phi\colon H \to \mathrm{Homeo}(M)$ ($\mathrm{Diff}(M)$); in other words, it is a choice of homeomorphisms (diffeomorphisms) f, g, and h satisfying the Heisenberg group relations.

We study continuous/smooth actions of H on surfaces S. We give a C^∞ gluing procedure to produce many smooth examples. We show, however, that under certain hypotheses the situation becomes rigid. Namely, suppose $S = \mathbb{R}^2$ is the plane and h is conjugate to a translation. Suppose there exists a non-central element $k \in H$ and an h-invariant line ℓ such that $k(\ell)$ is disjoint from ℓ. Then there exists a non-central $k' \in H$ such that k' and h are "transverse translations": $\mathbb{R}^2/\langle k', h\rangle$ is homeomorphic to the torus. Classifying such actions essentially reduces to classifying torus homeomorphisms. (Received September 25, 2012)