

1086-VJ-426

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MO 63103. *Equivalence of Cyclic  $p^2$  Actions on Handlebodies of Genus  $g$ .*

We consider all orientation-preserving  $\mathbb{Z}_{p^2}$ -actions, where  $p$  is prime, on 3-dimensional handlebodies  $V_g$  of genus  $g \geq 2$ . We study the graph of groups  $(\Gamma, \mathbf{G})$ , which determines a handlebody orbifold  $V(\Gamma(\mathbf{v}), \mathbf{G}(\mathbf{v})) \simeq V_g/\mathbb{Z}_{p^2}$ . This algebraic characterization is used to enumerate the total number of  $\mathbb{Z}_{p^2}$  group actions on such handlebodies, up to equivalence. (Received August 31, 2012)