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Jesse T. Prince-Lubawy* (jprincelubawy@una.edu), One Harrison Plaza, Florence, AL 35632.

Equivalence of \mathbb{Z}_4 -actions on handlebodies of genus g .

We consider all orientation-preserving \mathbb{Z}_4 -actions on 3-dimensional handlebodies V_g of genus $g \geq 1$. We study the graph of groups (Γ, \mathbf{G}) , which determines a handlebody orbifold $V(\Gamma(\mathbf{v}), \mathbf{G}(\mathbf{v})) \simeq V_g/\mathbb{Z}_4$. This algebraic characterization is used to enumerate the total number of \mathbb{Z}_4 group actions on such handlebodies, up to equivalence. (Received January 29, 2015)