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*Finite actions on the Klein four-orbifold and prism manifolds*

**Abstract:** We describe the finite group actions, up to equivalence, which can act on the orbifold $\Sigma(2,2,2)$, and their quotient types. This is then used to consider actions on prism manifolds $M(b,d)$ which preserve a longitudinal fibering, but do not leave any Heegaard Klein bottle invariant. If $\varphi\colon G \to \mathrm{Homeo}(M(b,d))$ is such an action, we show that $M(b,d) = M(b,2)$ and $M(b,2)/\varphi$ fibers over a certain collection of 2-orbifolds with positive Euler characteristic which are covered by $\Sigma(2,2,2)$. For the standard actions, we compute the fundamental group of $M(b,2)/\varphi$ and indicate when it is a Seifert fibered manifold.

## References

[1] Dummit D., Foote R., *Abstract Algebra*, Wiley, Hoboken, NJ, 2004.

[2] Kalliongis J., Ohashi R., *Finite group actions on prism manifolds which preserve a Heegaard Klein bottle*, Kobe J. Math. **28** (2011), no. 1, 69–89.

[3] Kalliongis J., Ohashi R., *Classifying non-splitting fiber preserving actions on prism manifolds*, Topology Appl. **178** (2014), 200–218.

[4] Kalliongis J., Ohashi R., *Finite actions on the 2-sphere and the projective plane*, preprint.

[5] McCullough D., *Isometries of elliptic 3-manifolds*, J. London Math. Soc. **65** (2002), no. 1, 167–182.

[6] Orlik P., *Seifert Manifolds*, Lecture Notes in Mathematics, 291, Springer, Berlin-New York, 1972.

[7] Scott P., *The geometries of 3-manifolds*, Bull. London Math. Soc. **5** (1983), 401–48.