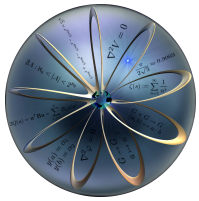

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examples of outer automorphism group

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It is easy to understand that $\mathrm{Out}\mathbb{Z} = \mathrm{Aut}\mathbb{Z} = \mathbb{Z}/2\mathbb{Z}$, since $\mathbb{Z}$ is abelian and there are no inner-automorphisms, save the trivial one.

Also, it is known that $\mathrm{Out}SL(2,\mathbb{Z}) = \mathbb{Z}/2\mathbb{Z}$

Another example is that, at least for orientable surfaces, the extended mapping class group (or the zeroth homeotopy group) of a surface F is related to its fundamental group via $\mathcal{M}^*(F) = \mathrm{Out}(\pi_1(F))$.

References

1. L. K. Hua, I Reiner *Automorphisms of unimodular group*, Trans Amer. Math. Soc. 71 (1951), 331-348.

2. H. Zieschang, E. Vogt, H. D. Coldewey, *Surfaces and planar discontinuous groups*, L.N.M. 875 (1981) Springer-Verlag.