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The i.i.d. State Convertibility in the Resource Theory of Asymmetry for Finite Groups

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We derive both the exact and approximate conversion rates between i.i.d. pure states under covariant operations in the resource theory of asymmetry for symmetries described by finite groups. We derive the formula for the exact conversion rate and thereby identify the relevant set of resource measures. The exact conversion is in general irreversible due to multiple independent resource measures, but we also find the condition for reversibility. On the other hand, we show that the approximate conversion rate either diverges or equals zero, which implies that the asymmetry can be amplified infinitely if we allow a vanishingly small error. We reveal the underlying mechanism of such a counterintuitive phenomenon, by showing the existence of maximally uniform states that act as a catalysis.
https://arxiv.org/abs/2312.15758

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