

Outer Automorphism Anomalies

Tuesday, November 8, 2022 4:45 PM (15 minutes)

We discuss anomalies associated with outer automorphisms in gauge theories based on classical groups, namely charge conjugations for $SU(N)$ and parities for $SO(2r)$. We emphasize the inequivalence between two versions of charge conjugation for $SU(N)$ symmetries, and also two versions of parity for $SO(2r)$ symmetries. The subgroups that commute with the outer automorphisms are identified. Some charge conjugations can lead to a paradox, which is resolved by the observation that they are anomalous and hence not symmetries. We then discuss anomaly matching conditions that involve the charge conjugations or parities. Interesting examples are given where the charge conjugation is spontaneously broken.

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