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Generalized CP from non-invertible selection rules

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In this talk, we propose a framework in which fields are labeled by basis elements of a fusion algebra with non-invertible fusion rules. In particular, we consider the case where fields are labeled by conjugacy classes of a finite group rather than its irreducible representations.
When the fusion rules possess a Z2 symmetry identified with charge conjugation, a CPinvariant system can be consistently defined together with parity transformation. Furthermore, it is found that combining group-based flavor symmetries underlying non-invertible selection rules with CP symmetry naturally leads to a generalized CP transformation. We also demonstrate the possibility of spontaneous CP violation in this framework and discuss its implications for Yukawa textures.

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