

Entanglement Maximization and Symmetry Selection in Composite Higgs Models

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We propose a general mechanism for solving the strong CP problem with a heavy axion generated by confinement in a mirror sector. We present a simple realization of our mechanism in a mirror grand unified theory (GUT). The mirror GUT sector remains unbroken and dynamically generates a calculable heavy mass scale via confinement without fine tuning. Models in this class feature a heavy axion, whose potential is less sensitive to Planck-scale corrections, as well as a rich hidden sector from the confined mirror GUT. The solution to the strong CP problem remains unspoiled by the presence of additional phases in the GUT Yukawas, while still allowing the possibility of electric dipole moments within the reach of future experiments. Our proposal offers new directions in GUT model building, axion phenomenology, dark matter, and cosmology.

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