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A natural model of spontaneous CP violation

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We examine the possibility of building a natural non-supersymmetric model of spontaneous CP violation equipped with the Nelson-Barr (NB) mechanism to address the strong CP problem. Our approach is to utilize a doubly composite dynamics where the first confinement of the CFT occurs at the scale of spontaneous CP violation (SCPV) and the second confinement at the TeV scale. A holographic dual description of this 4D set-up via a warped extra dimension with three 3-branes provides an explicit realization of this model, radiative corrections to the strong CP phase are well under control, and the coincidence of mass scales, which we generally encounter in NB models, is addressed. Our model also provides an explanation to the quark Yukawa hierarchies, and a solution to the gauge hierarchy problem just as in the usual Randall-Sundrum model with the Higgs being localized on the TeV brane.

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