High Energy Physics - Theory

G-flux in F-theory and algebraic cycles

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We construct explicit G4 fluxes in F-theory compactifications. Our method relies on identifying algebraic cycles in the Weierstrass equation of elliptic Calabi-Yau fourfolds. We show how to compute the D3-brane tadpole and the induced chirality indices directly in F-theory. Whenever a weak coupling limit is available, we compare and successfully match our findings to the corresponding results in type IIB string theory. Finally, we present some generalizations of our results which hint at a unified description of the elliptic Calabi-Yau fourfold together with the four-form flux G4 as a coherent sheaf. In this description the close link between G4 fluxes and algebraic cycles is manifest.

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