Constraining F-theory Model Building with QCD Axions

Keren Chen*†[1], Qinjian Lou*‡[1], and Yinan Wang§[1,2]

[1]Peking University – China
[2]Center for High Energy Physics – China

Abstract

In this paper, we investigate axion physics in 4D F-theory MSSM models. We derive the axion coupling term with QCD gauge fields and the axion potential from a top-down perspective, from both IIB superstring and the dual M-theory picture. For the explicit geometric model, we employ the "quadrillion" landscape of 4D F-theory models with the exact Standard Model chiral spectrum, and study simple base threefolds such as ${P}ˆ3$, ${P}ˆ1×{P}2$, $the generalized Hirzebruch three fold ${\tilde{{F}}}_3$ and ${P}1 × {P}1 × {P}1$. We derive exclusion co

*Speaker
†Corresponding author: keren.chen246@gmail.com
‡Corresponding author: qinjian.lou@pku.edu.cn
§Corresponding author: ynwang@pku.edu.cn