

The QCD Axion and Unification

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- We consider the predictions for axion mass in renormalizable SU(5) GUTs
- The axion lives mostly in the phase of 24_H responsible for **SU(5) → SM**
- PQ scale ↔ GUT scale

Come join my virtual office #24 Friday 3-4 pm CEST

DFSZ in SU(5) x U(1)_{PQ} [1911.05738]

$$\bar{5}, 10, 5_H, 24_H, + 45_H + 5'_H$$

Minimal SU(5)
Georgi-Glashow

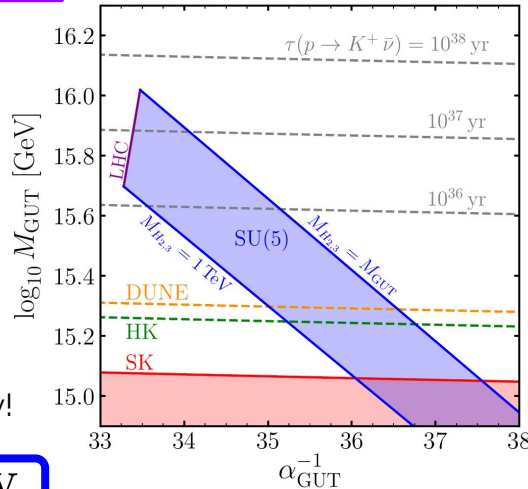
$$f_a \equiv \frac{v_\Sigma}{N} = \sqrt{\frac{6}{5\pi\alpha_{GUT}} \frac{M_{GUT}}{10}}$$

$$\Phi_1 \sim (8, 2, 1/2)$$

$$M_{\Phi_1} > 1 \text{ TeV}$$

clean prediction for p decay!

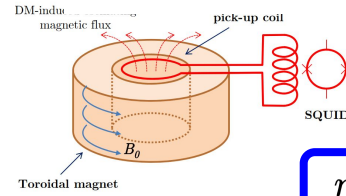
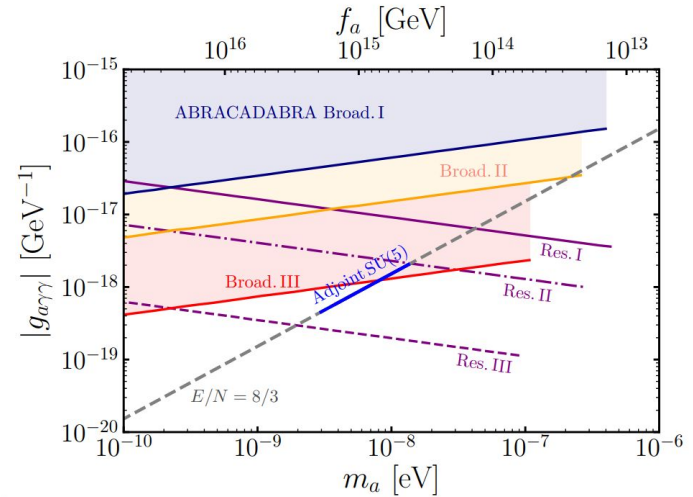
$$m_a = (2 - 16) \times 10^{-9} \text{ eV}$$



KSVZ in SU(5) x U(1)_{PQ} [1908.01772]

$$\bar{5}, 10, 5_H, 24_H, + 45_H + 24$$

Neutrino masses and colored fermions



$$m_a = (3 - 13) \times 10^{-9} \text{ eV}$$