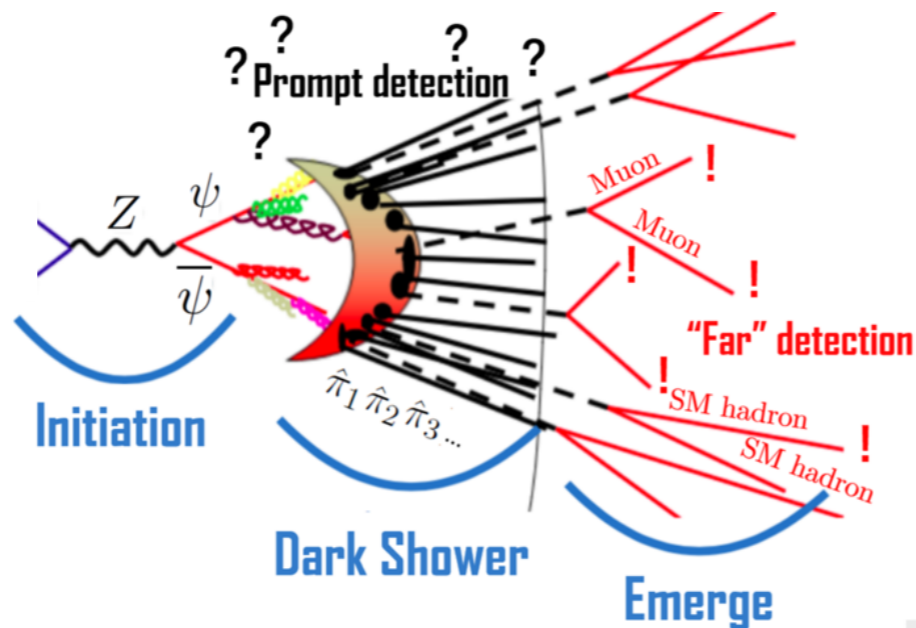


Electroweak Portal Dark Showers



JIANG Xuhui

jiangxh at ihep dot ac dot cn

Decay to dark quarks



Based on:

JHEP 04 (2024) 081,
and, 2408.13304

With:

Hsin-Chia Cheng (Davis),
Lingfeng Li (Brown), and,
Ennio Salvioni (Sussex)

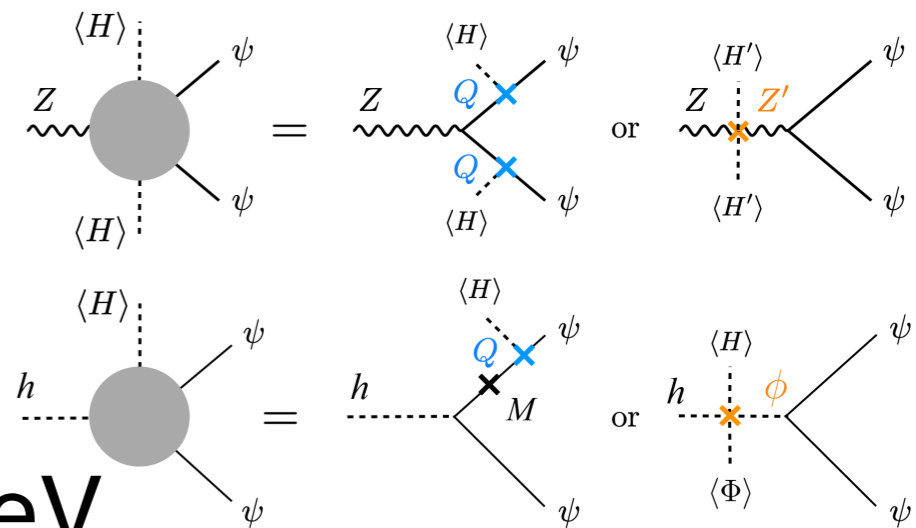
What to be interesting

- Dark showers

$$Z(Z') \rightarrow \bar{\psi}\psi \implies \hat{\pi}_1 \hat{\pi}_2 \dots$$

~ 5 dark pions per Z, w $m_{\hat{\pi}} \sim 1 \text{ GeV}$

To measure exotic decay BR.



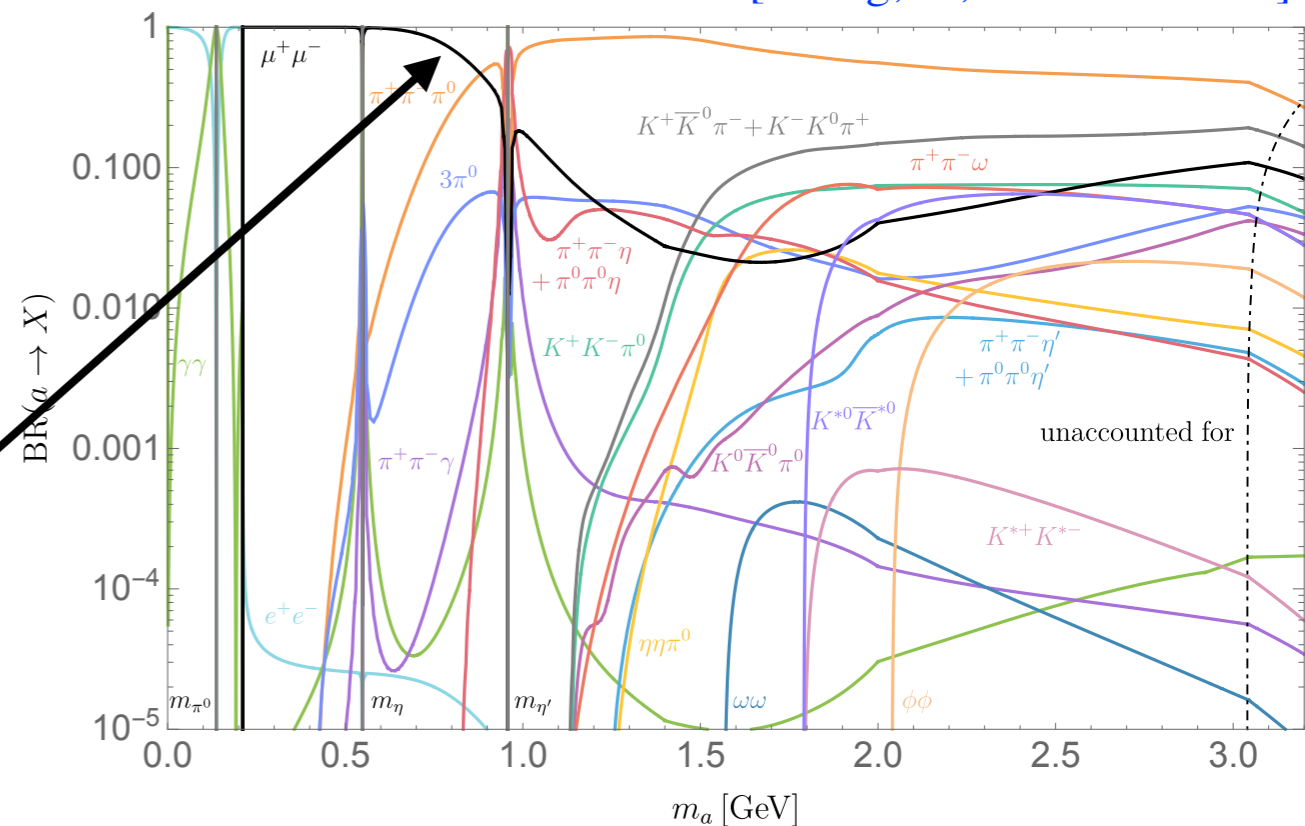
- CP-odd

$$\mathcal{L} = -C_f \frac{\partial_\mu \hat{\pi}}{f_a} \bar{f} \gamma^\mu \gamma_5 f$$

$$\hat{\pi} \rightarrow \mu^+ \mu^-$$

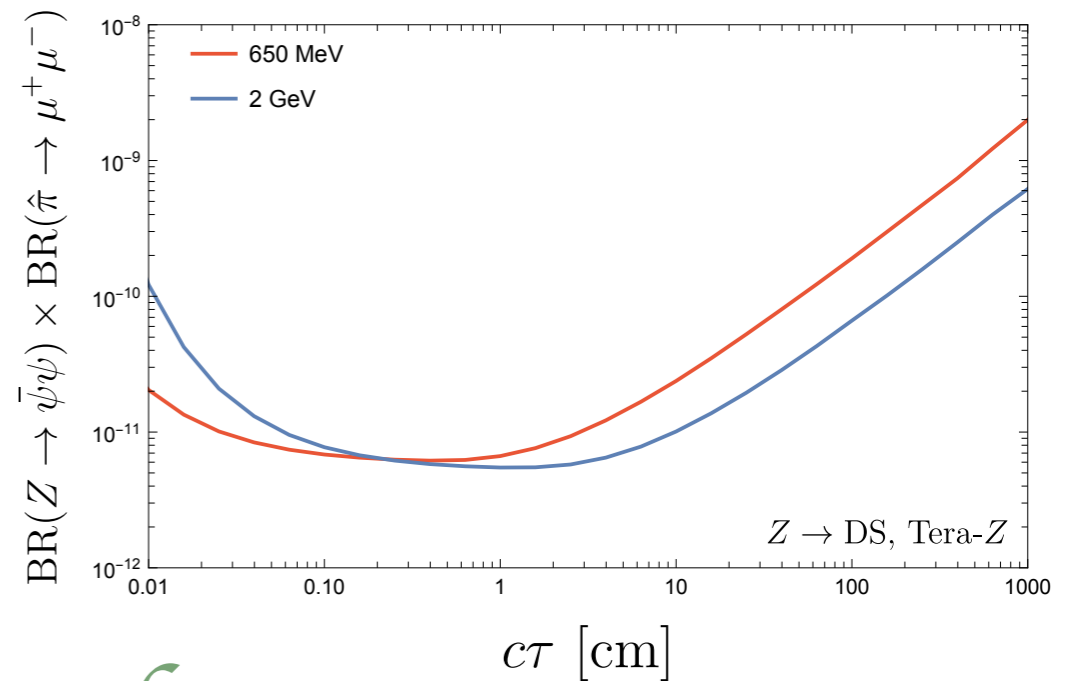
An excellent channel, searched at colliders!

[Cheng, Li, and E. Salvioni]



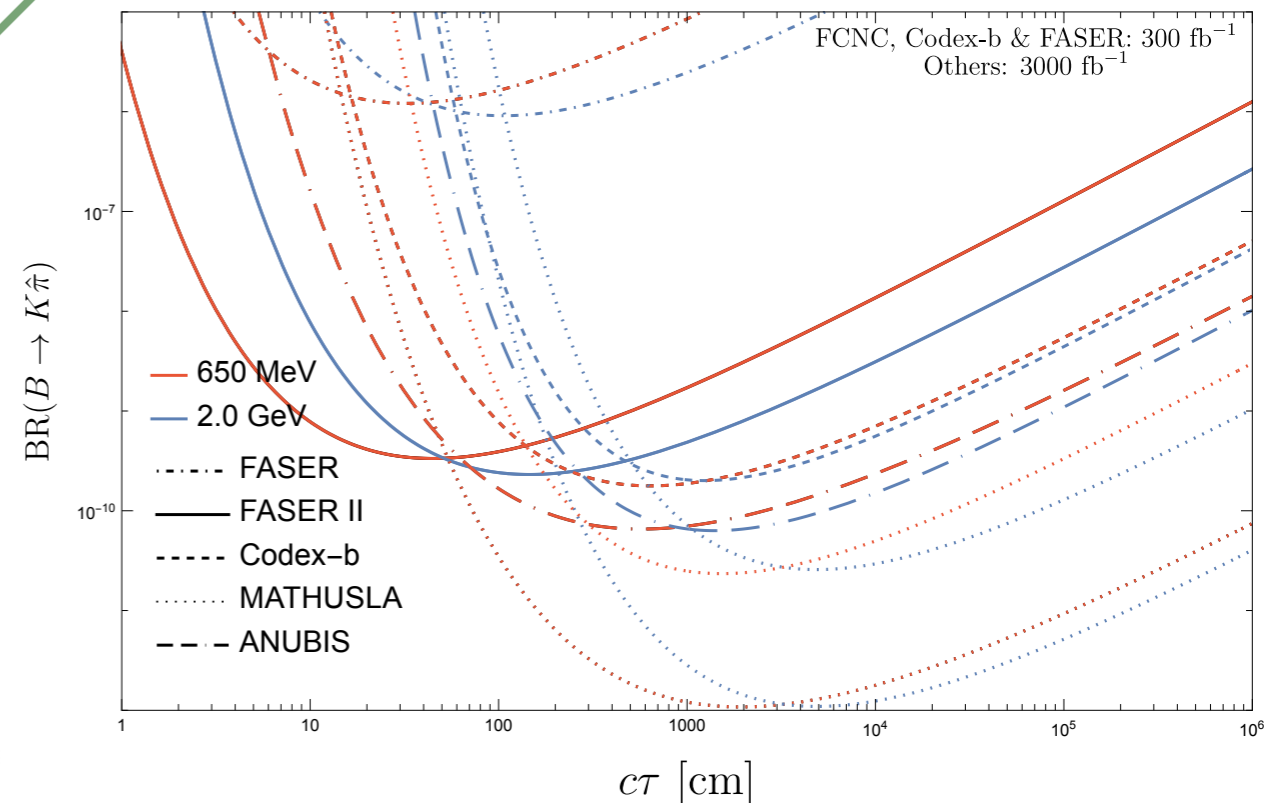
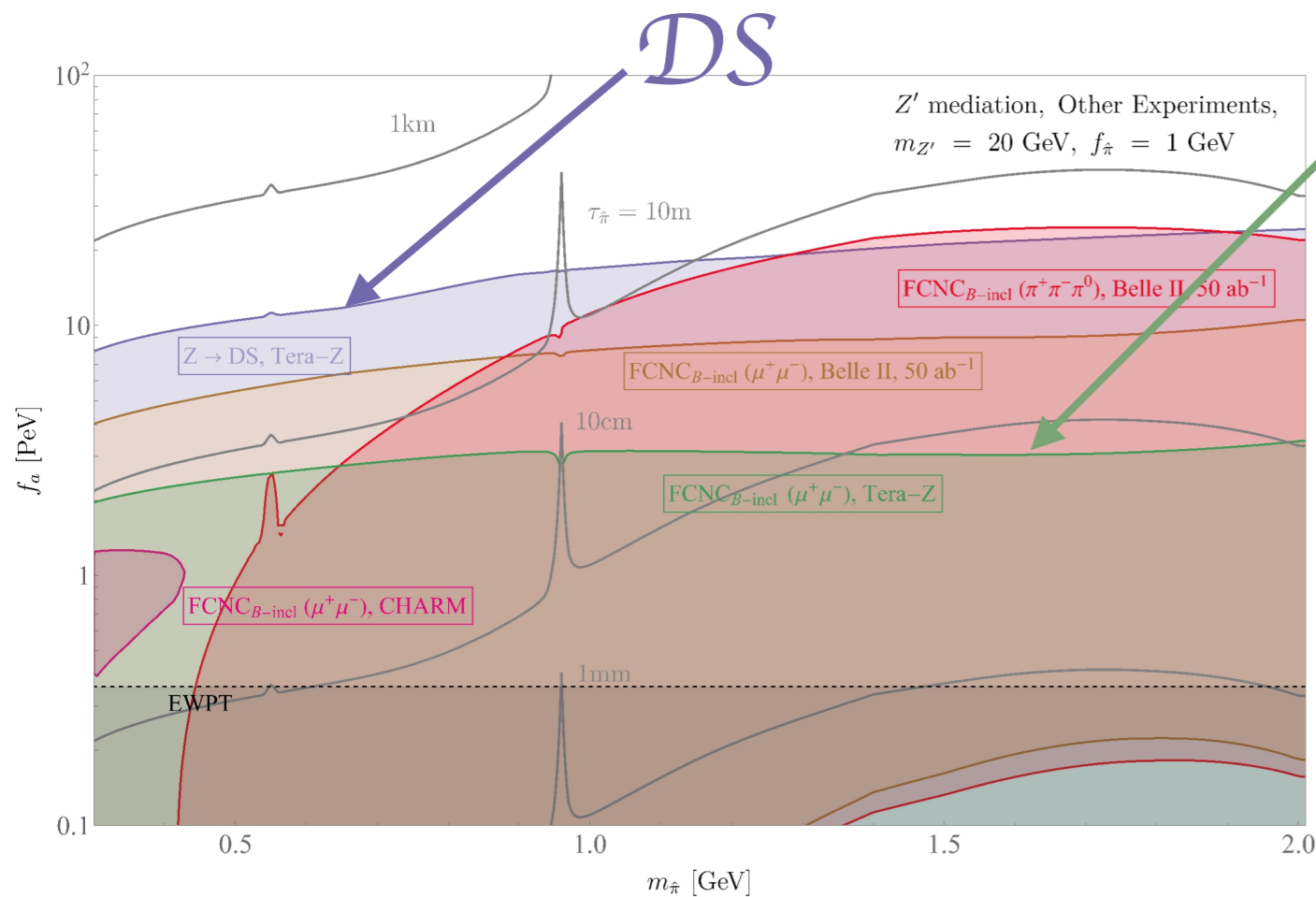
🌀 Tera-Z & Other Opportunities

- Z abundance $\sim \mathcal{O}(10^{12})$
- Dark showers (DS)
- f_a up to ~ 10 PeV



Also FCNC

■ At far detectors



Complementarity: a longer lifetime range