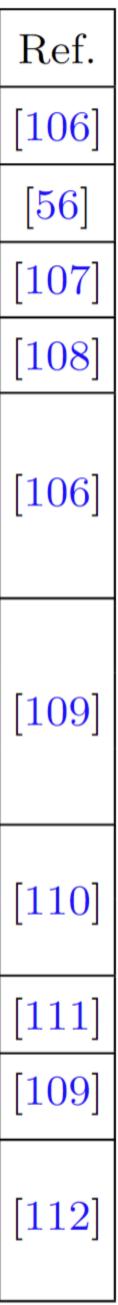
Portal	Effective operator	$\sqrt{s}  [\text{GeV}]$	$\mathcal{L}[ab^{-1}]$	Sensitivity	Figs.	
$\operatorname{scalar}$	$\lambda_{HP} H ^2\Phi^2 \to \text{scalar mixing sin }\theta$	250	5	$\sin\theta \sim 10^{-1}$	21	[
fermion	$y_{\ell} \bar{\chi}_L S^{\dagger} \ell_R + \text{H.c.}$	250	5	covering $100 \mathrm{GeV} < m_S < 170 \mathrm{GeV}$	22	
	$\kappa \Phi \overline{q'}_L \ell_R + \text{H.c.}$	250	5	$m_{\Phi} \sim 10 \text{ TeV} \text{ for } c\tau_0 \in [10, 10^4] \text{ mm}$	23	[
	$y\Phi\bar{F}_L\ell_R$ + H.c.	240	5.6	$y\theta_L \in [10^{-11}, \ 10^{-7}]$	24	[
gauge	$ \tilde{K}_{\mu} \left( g \frac{m_K^2 t_W}{m_{Z,SM}^2 - m_K^2} \epsilon J_Z^{\mu} + e \epsilon J_{em}^{\mu} \right)  + g_D \bar{\chi} \left( \tilde{K}_{\mu} + \frac{t_W m_{Z,SM}^2}{m_K^2 - m_{Z,SM}^2} \epsilon \tilde{Z}_{\mu} \right) \gamma^{\mu} \chi $	250	5	$\epsilon \sim 10^{-3} \mbox{ for } m_K < 125 \mbox{ GeV}$	25, 26	[
		250	5	$\epsilon \sim 0.1$ for $m_{\chi} \sim 50 \text{ GeV}$		
	$arepsilon A_\mu ar\chi \gamma^\mu \chi$	91.2	2.6	$\epsilon \sim 0.02 \mbox{ for } m_\chi \sim 5 \mbox{ GeV}$	27	[
		160	16	$\epsilon \sim 0.5$ for $m_{\chi} \sim 10 { m ~GeV}$		
	$\frac{1}{2}\mu_{\chi}\bar{\chi}\sigma^{\mu\nu}\chi F_{\mu\nu} + \frac{i}{2}d_{\chi}\bar{\chi}\sigma^{\mu\nu}\gamma^{5}\chi F_{\mu\nu}$	91.2	100	$\mu_{\chi}, d_{\chi} \sim 4 \times 10^{-7} \mu_B$ for $m_{\chi} < 25 \mathrm{GeV}$	28	[
	$-a_{\chi}\bar{\chi}\gamma^{\mu}\gamma^{5}\chi\partial^{\nu}F_{\mu\nu}+b_{\chi}\bar{\chi}\gamma^{\mu}\chi\partial^{\nu}F_{\mu\nu}$	240	20	$a_{\chi}, b_{\chi} \sim 1 \times 10^{-6} \mathrm{GeV^{-2}}$ for $m_{\chi} < 80 \mathrm{GeV}$	20	
$\mathbf{EFT}$	$\frac{1}{\Lambda^2} \sum_i \left( \bar{\chi} \gamma_\mu (1 - \gamma_5) \chi \right) \left( \bar{\ell} \gamma^\mu (1 - \gamma_5) \ell \right)$	250	5	$\Lambda_i \sim 2 \text{ TeV} (m_\chi = 0)$	29	[
	$rac{1}{\Lambda_A^2}ar\chi\gamma_\mu\gamma_5\chiar\ell\gamma^\mu\gamma_5\ell$	250	5	$\Lambda_A \sim 1.5 ~{\rm TeV}$	30	[
	$\sum_{i} \frac{1}{\Lambda_{i}^{2}} \left( \bar{e} \Gamma_{\mu} e \right) \left( \bar{\nu}_{L} \Gamma^{\mu} \chi_{L} \right) + \text{H.c.}$ $\Gamma_{\mu} = 1, \gamma_{5}, \gamma_{\mu}, \gamma_{\mu} \gamma_{5}, \sigma_{\mu\nu}$	240	20	$\Lambda_i \sim 1 \text{ TeV} (m_\chi = 0)$	31	



## **To-do list**

- Mention more DM & dark particle scenarios in the "introduction",
- More comments on the summary table. Some brief comments on the prospects with 20 ab-1.
- Comparison with prospects at (HL)-LHC in Figs. 21, 24, 25, 27and 28.

Comparison with limits from LEP in Fig. 26. Contributions from Pengfei Yin.

