Dark Matter Direct Detection in t-channel mediator models

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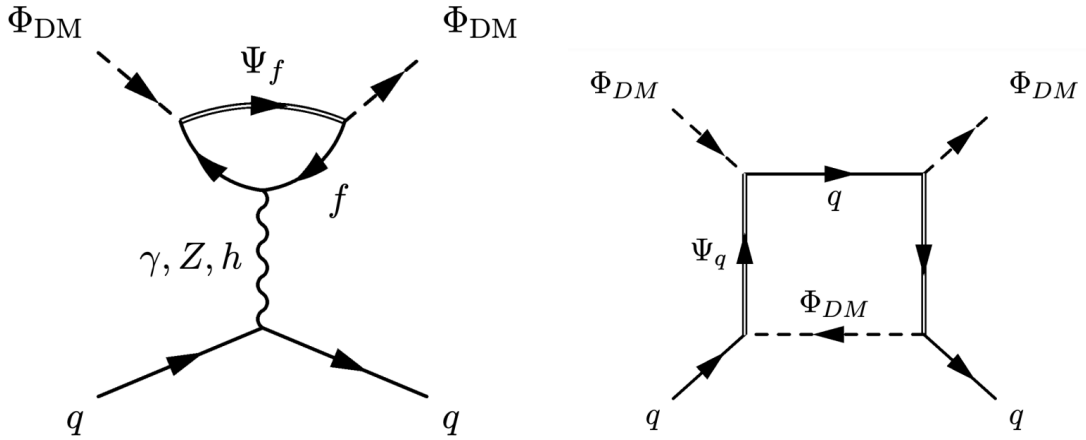
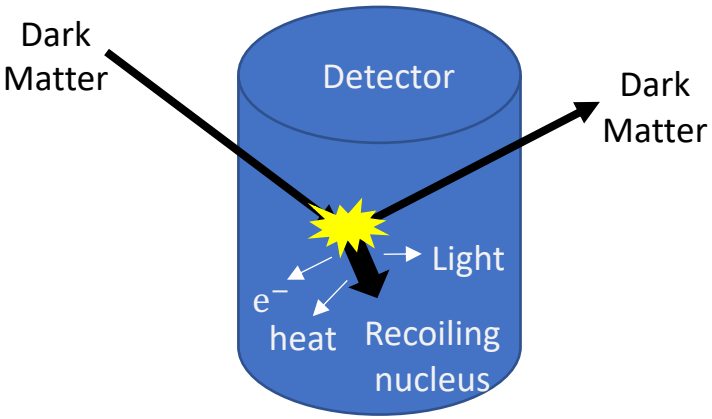
$$\mathcal{L}_{\text{scalar}} = \Gamma_L^{f_i} \bar{f}_i P_R \Psi_{f_i} \Phi_{\text{DM}} + \Gamma_R^{f_i} \bar{f}_i P_L \Psi_{f_i} \Phi_{\text{DM}}$$

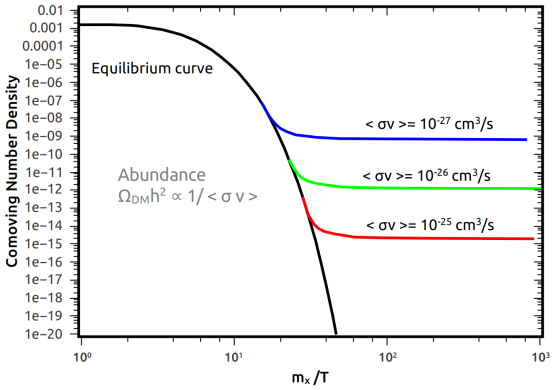
$$\mathcal{L}_{\text{fermion}} = \Gamma_L^{f_i} \bar{f}_i P_R \Phi_{f_i} \Psi_{\text{DM}} + \Gamma_R^{f_i} \bar{f}_i P_L \Phi_{f_i} \Psi_{DM}$$

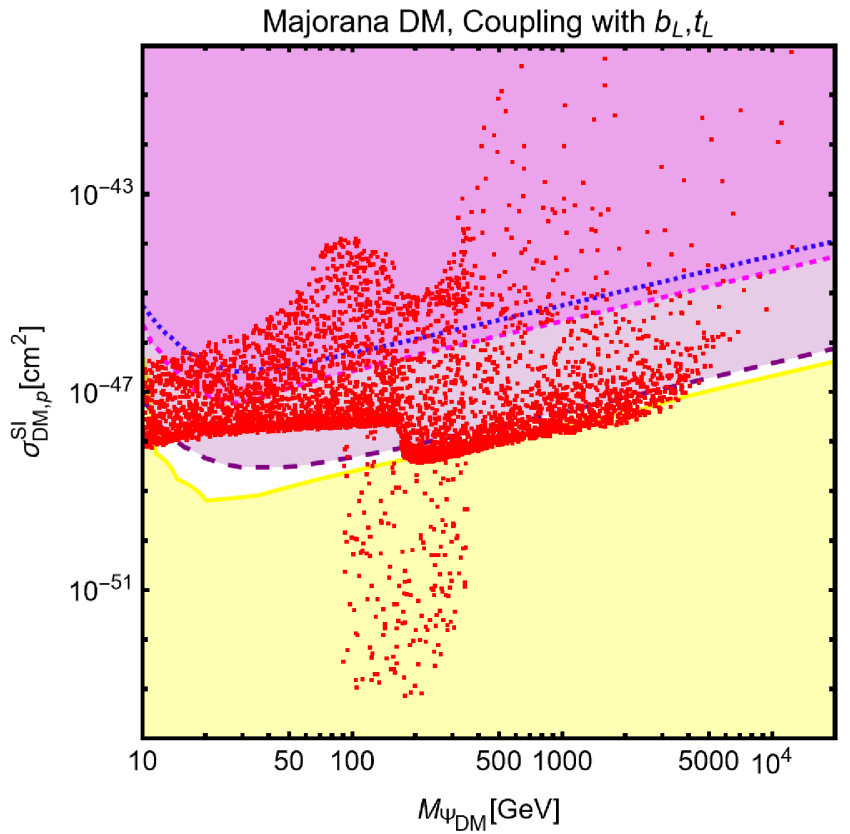


Direct Detection



Relic Density





Probing ultralight axions effects on structure formation and CMB anisotropies

S. Arcari, UniFe

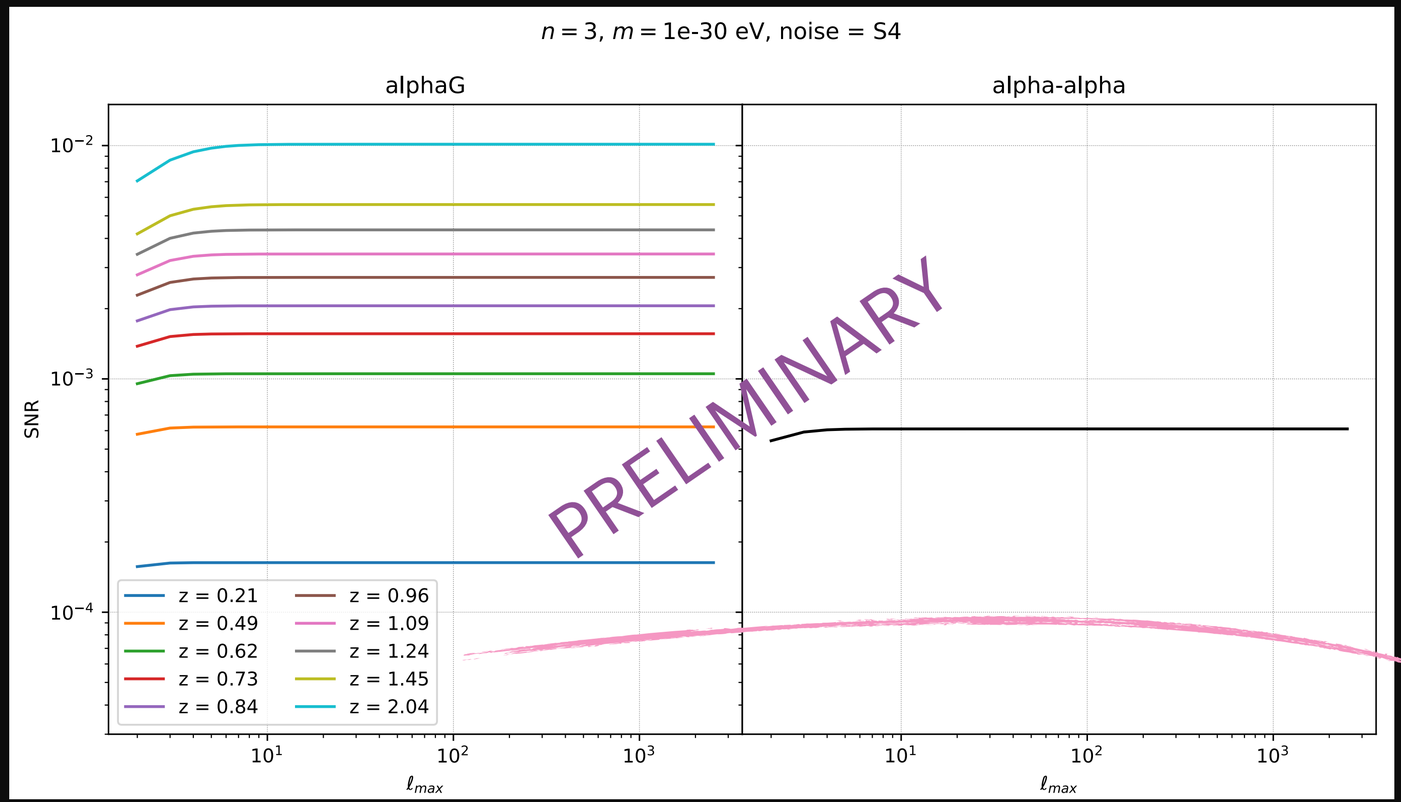
$$\mathscr{L}_{CS} = -\frac{1}{2}\beta\,\partial_\mu\phi\,A_\nu\,\tilde{F}^{\mu\nu} \quad \rightarrow \quad \alpha(\hat{n}) = \frac{\beta}{2}[\bar{\phi}(\tau_s) - \bar{\phi}(\tau_0)] + \frac{\beta}{2}\delta\phi[\tau_s, (\tau_0 - \tau_s)\hat{n}]$$

$$\ddot{\bar{\phi}} + 2\mathscr{H}\dot{\bar{\phi}} + a^2\frac{\partial V}{\partial\bar{\phi}} = 0$$

$$\ddot{\delta\phi}_{\vec{k}} + 2\mathscr{H}\dot{\delta\phi}_{\vec{k}} + \left(k^2 + a^2\frac{\partial^2 V}{\partial\bar{\phi}^2}\right)\delta\phi_{\vec{k}} = 0$$

$$V(\phi) = m_\phi^2 f^2\left[1 - \cos\frac{\phi}{f}\right]^n$$

$$C_\ell^{\alpha G_i} = 4\pi\int\frac{\mathrm{d}k}{k}\,\mathscr{P}_{\mathscr{R}}(k)\Delta_\ell^\alpha(k)\Delta_\ell^{G_i}(k)$$



Euclid IST redshift binning

Models of Accidental Dark Matter with a Fundamental Scalar

Stefano Palmisano (speaker), F. Rescigno, F. Troni

29 September 2023

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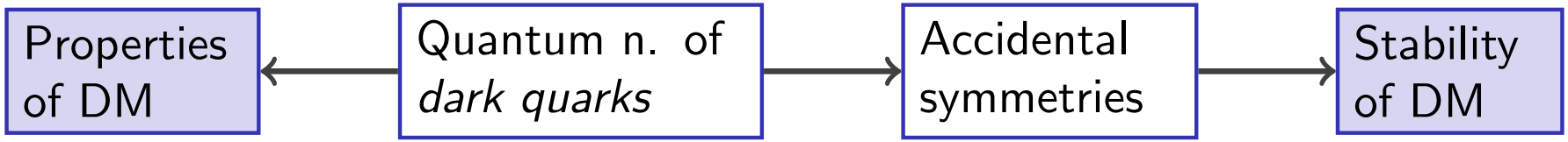
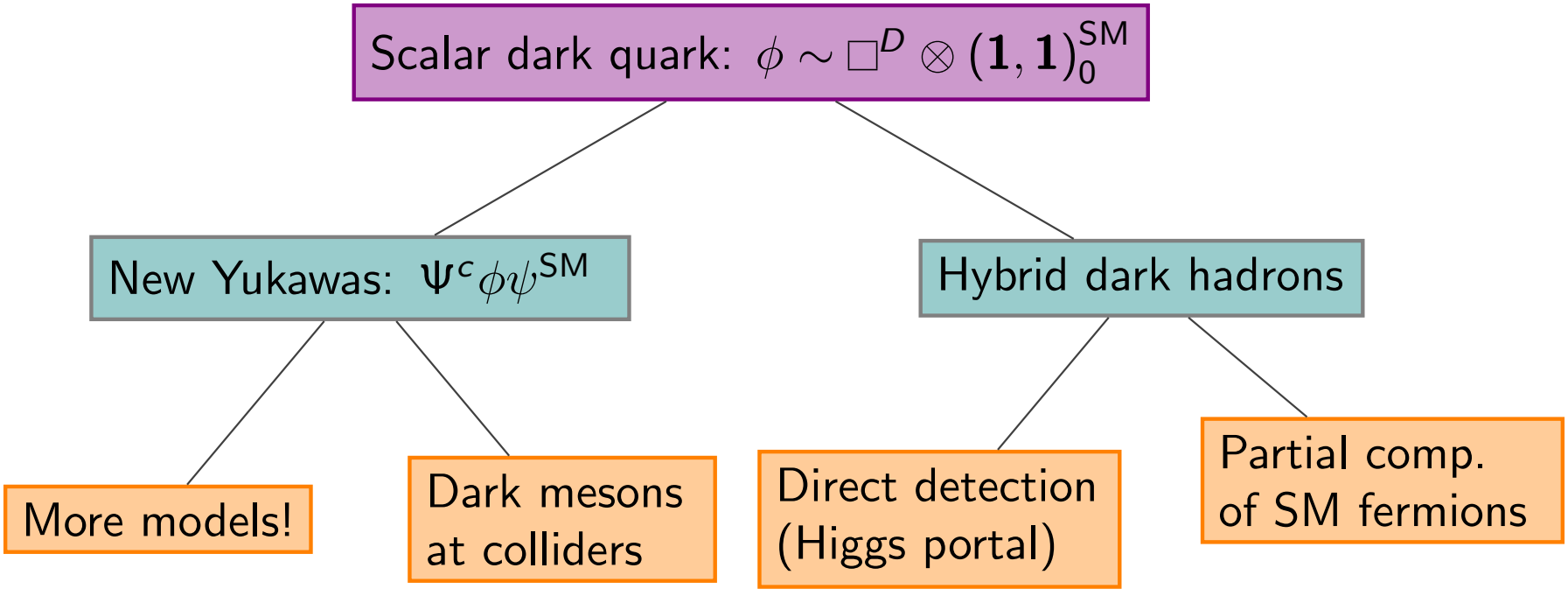


[arXiv:1503.08749] O. Antipin, M. Redi, A. Strumia and E. Vigiani

[arXiv:1707.05380] A. Mitridate, M. Redi, J. Smirnov and A. Strumia



Thanks for your attention!