Comparing BSM Scenarios using EFT

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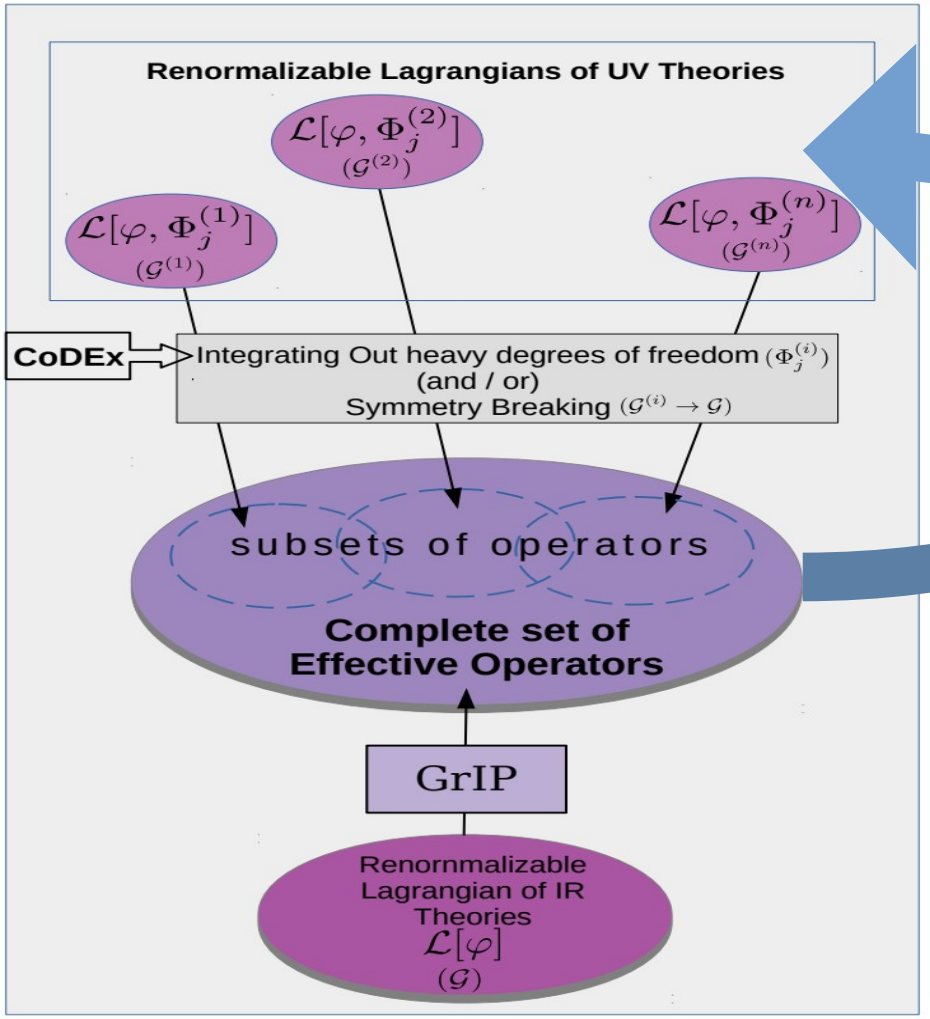


Tracing back UV Scenarios

Comparing UV Scenarios

- There are some observable which encodes the effect of higher dimensional operators.

- Example: Electroweak Precision Observable, Higgs decay widths...

- Oblique parameters in terms of WCs

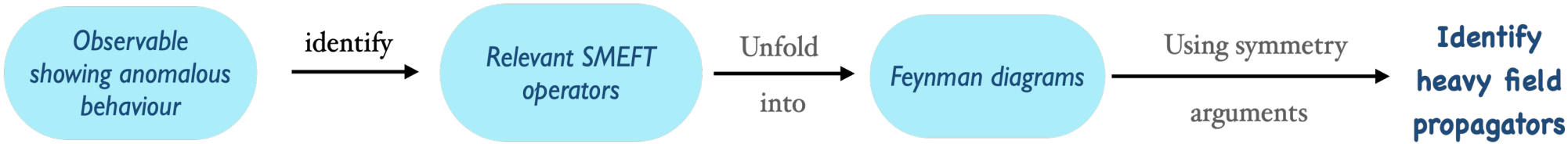
$$\mathcal{O}_{WB} = 2gg' H^\dagger \tau^a H W^a_{\mu\nu} B^{\mu\nu}$$
$$\mathcal{O}_W = ig\left(H^\dagger \tau^a \overleftrightarrow{D^\mu} H\right) D^\nu W^a_{\mu\nu}$$
$$\mathcal{O}_B = ig' Y_H \left(H^\dagger \overleftrightarrow{D^\mu} H\right) \partial^\nu B_{\mu\nu}$$

$$S = \frac{c_Z^2 s_Z^2}{\alpha} \frac{4m_Z^2}{\Lambda^2} (4c_{WB} + c_W + c_B)$$
$$T = \frac{1}{\alpha} \frac{2v^2}{\Lambda^2} c_T$$
$$\mathcal{O}_T = \tfrac{1}{2}\left(H^\dagger \overleftrightarrow{D}_\mu H\right)^2$$

- Experimental observables are connected to the Wilson Coefficients of effective operators.

- Deviation from SM predictions might be captured including higher dimensional operators.

Our proposed approach:



Takeaway

- We can trace back the UV scenarios depending on what observable shows the anomaly.
- Some effective operators shares common origin.
- Involving more observables or effective operators helps to pin down UV scenarios more precisely.