

# Search for a Self Interacting Dark Mater at the CMS Experiment

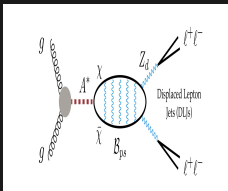
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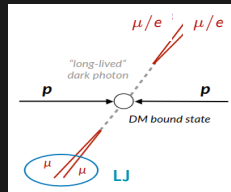
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# Self Interacting Dark Matter Model

- 1 Light  $Z_d \rightarrow$  Boosted  $Z_d$
- 2 Small  $Z_d$  - SM Coupling  
 $\rightarrow$  Long-Lived  $Z_d$



Displaced decays of boosted  $Z_d \rightarrow$  Displaced, collimated leptons (Displaced Lepton Jets (LJs))



## Free Parameters:

- Bound state mass ( $m_B$ )
- Dark photon mass ( $m_{Z_d}$ )
- Kinetic mixing between  $Z_d$  and SM,  $\epsilon$

## Reconstruction Objects:

- PF electrons
- PF Photons
- PF Muons
- DSA Muons

## Signal:

- $m_B$ : from 100 to 1000 GeV.
- $m_{Z_d}$ : from 0.25 to 5 GeV.
- $Z_d L_{xy}$ : from 0.3 to 300 cm.

