

A DARK LIGHTNING TALK

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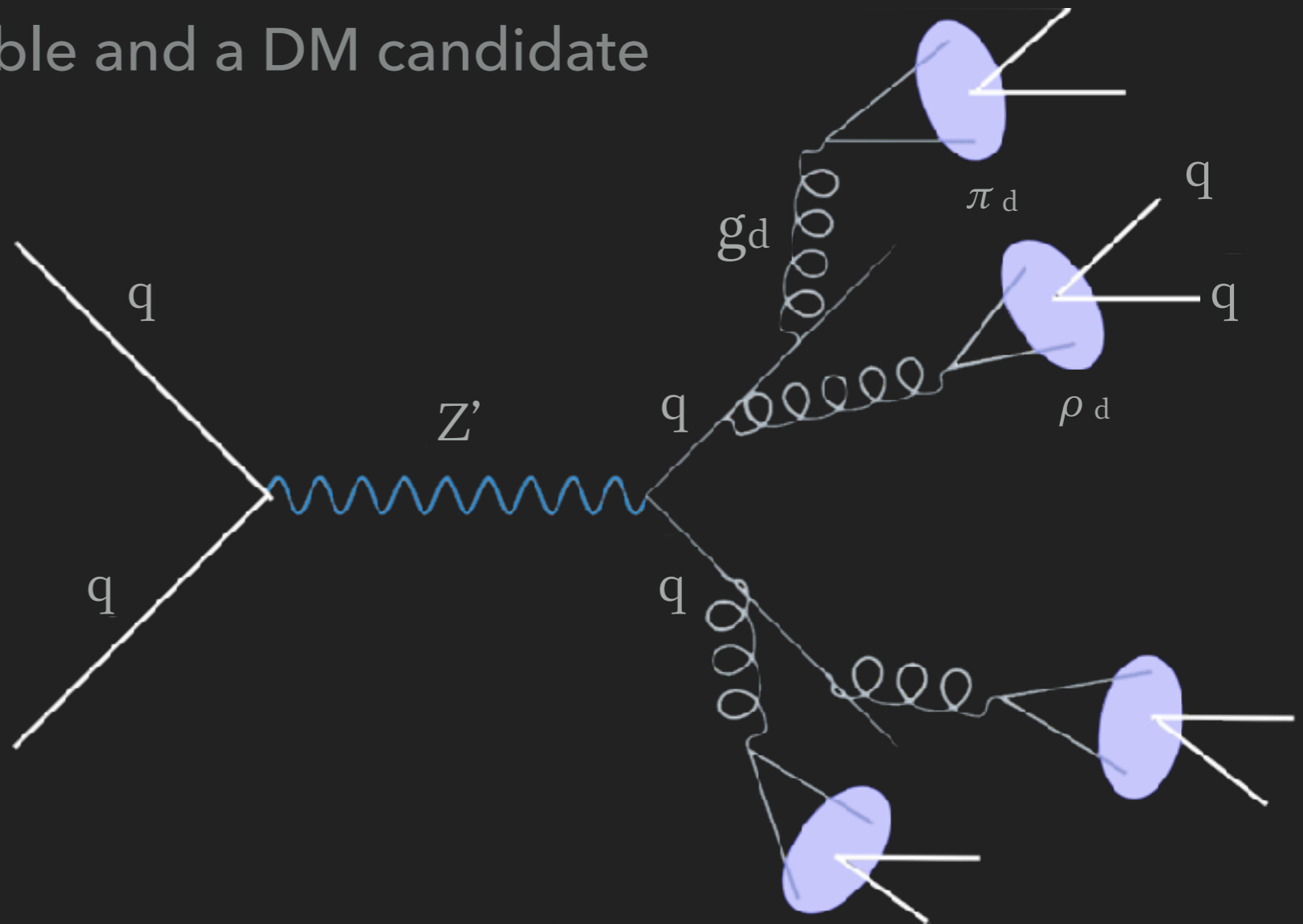
**DARK JET RESONANCES**

## COMPOSITE DARK MATTER

- ▶ Direct and indirect WIMP searches have come up empty so far
- ▶ Cosmological simulations allow self-interacting dark matter (DM)
  - ▶ E.g. composite DM arising from a “dark” sector with confinement (“dark QCD”)
- ▶ Combined with asymmetric production, composite DM could explain mass and number density of DM and Baryons
- ▶ Requires heavy mediator linking hidden sector to visible sector

## DARK QCD

- ▶ Hidden sector with confinement coupled to SM through a heavy mediator
- ▶ Showering and hadronisation happens in the dark sector
- ▶ The lightest baryon is stable and a DM candidate
- ▶ Some mesons might decay back to SM according to the specific model parameters



# BENCHMARK SIGNAL MODELS

- ▶ Different realisations can lead to very different detector signatures
- ▶ Composition of visible and invisible partons in the jet dependent on parameter choice:
  - ▶ Exotic I: Displaced vertices, emerging jets
  - ▶ Exotic II: Semi-visible jets
  - ▶ My analysis targets **SM QCD-like** models
    - ▶ With s-channel mediator decaying to two dark quarks
- ▶ Four models implemented in Pythia Hidden Valley process
  - ▶ All have larger confinement scales than SM QCD
  - ▶ Based on [arXiv:1712.09279](https://arxiv.org/abs/1712.09279)

