

# Z Boson Decay into the Hidden Sector ( $Z \rightarrow \gamma_D H_D$ )

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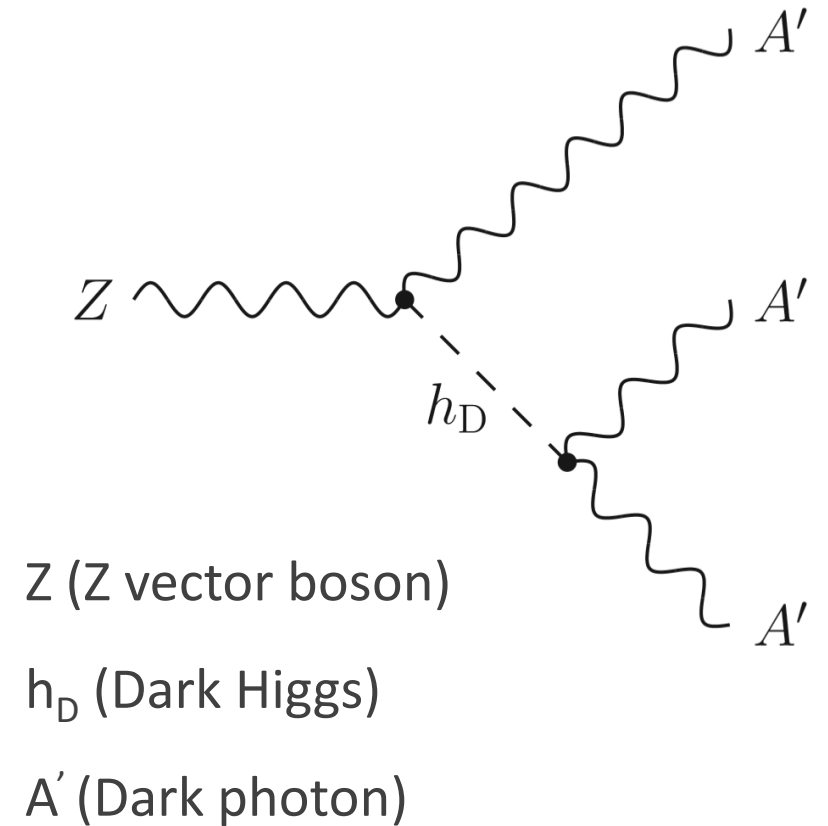
BAILEY WEAKLEY

DR. STUPAK

# The Decay

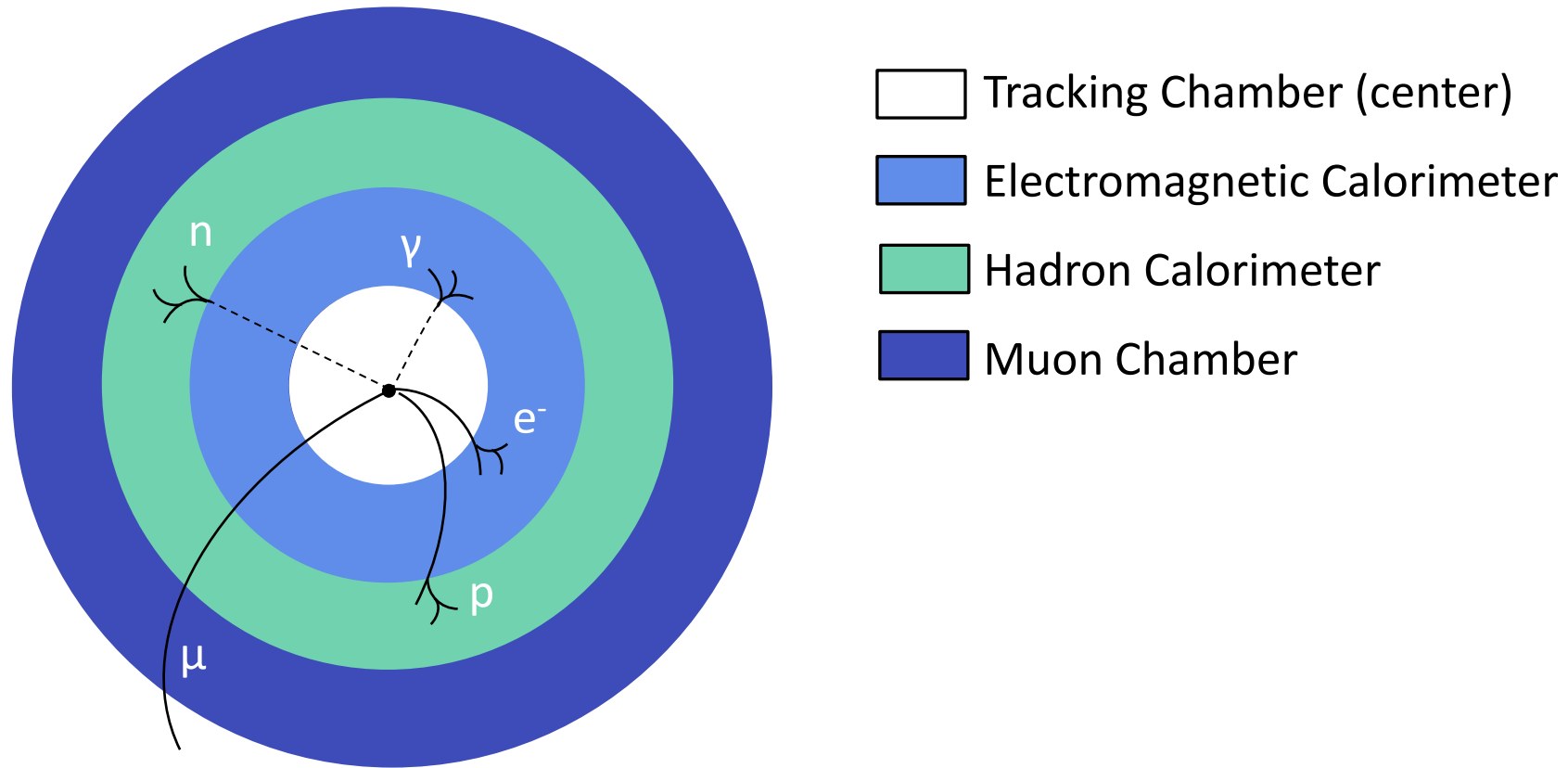
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- $Z \rightarrow \gamma_D H_D \rightarrow \gamma_D \gamma_D$
- Hidden/Dark Sector
- Do we have sensitivity to this model?
  - Will we be able to detect this in the ATLAS detector?



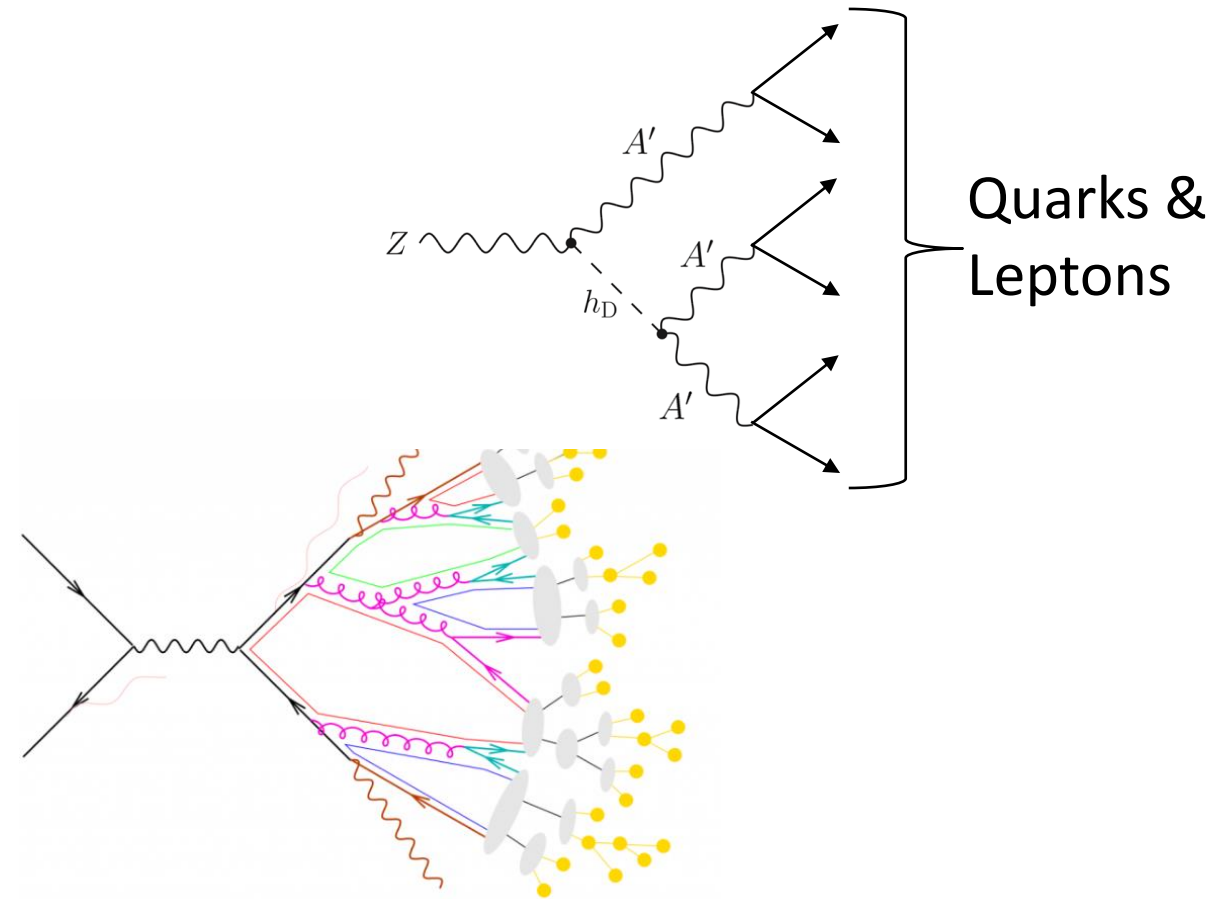
# The ATLAS Detector

Simplified Cross-Section of the ATLAS Detector



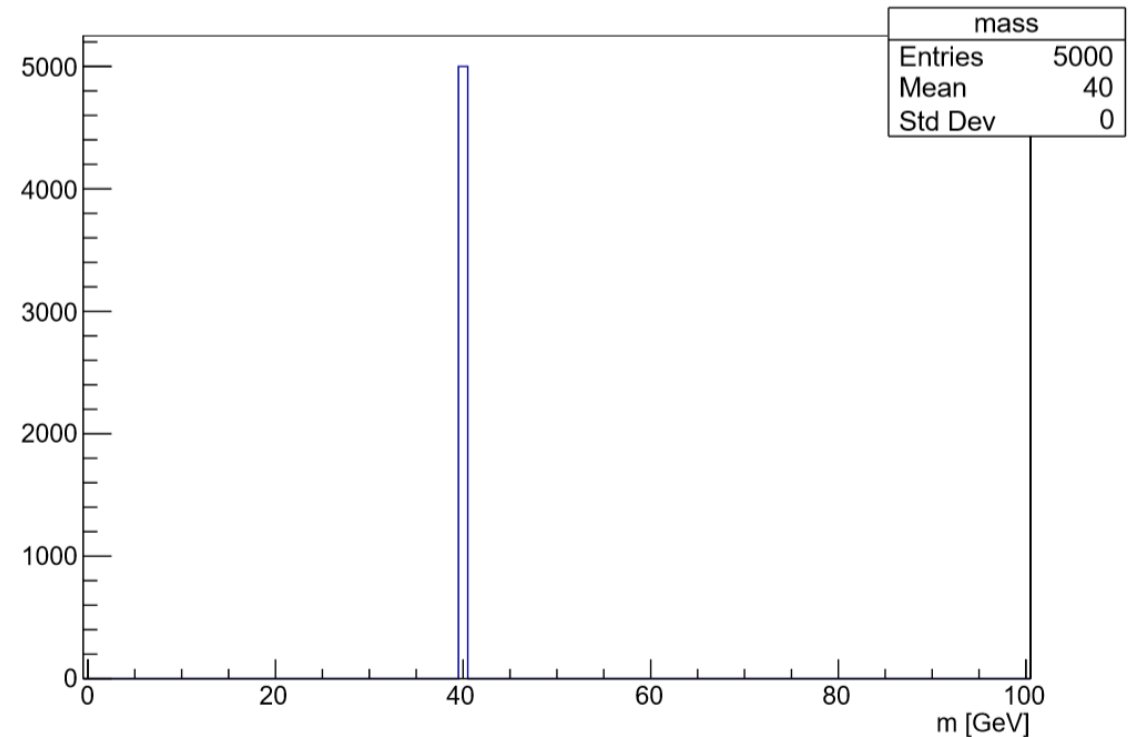
# Parton Showers and Hadronization

- Parton Showers
  - Partons: quarks and gluons
  - Due to color confinement
  - Pulling quarks and antiquarks out of vacuum
- Hadronization
  - Converts partons into observable hadrons



# Monte Carlo Event Generator

- Generates simulation of random high-energy particle collisions using standard model predictions
- Analyze using ROOT and python



# Questions?

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