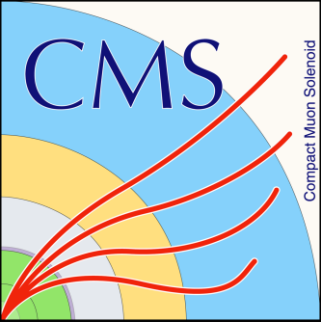# Dark SUSY 2018 MC Proposal
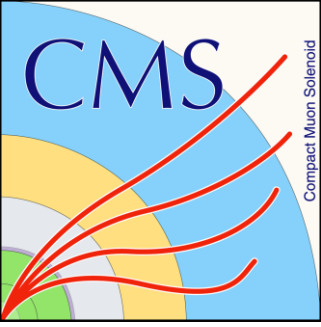
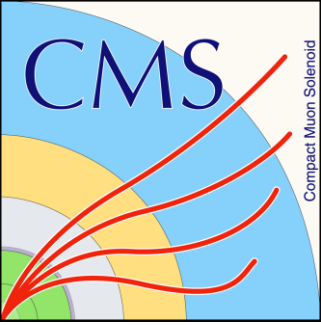Wei Shi

Generator Meeting

Proposal

- Our desired best choice
  - Go with MadGraph5(MG5) with privately generated LHE(pLHE)
- Facts
  - Few man power
    - I am the only student on this
  - No expertise
    - Need expert's real help to proceed
  - Instead, we propose keep using MG4 and pLHE
    - Not optimal for us either, but it's what we can do at best now
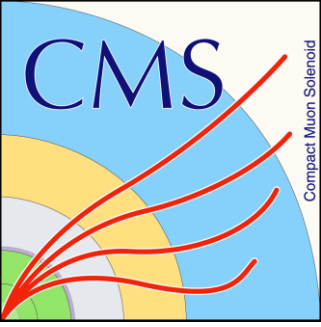
Why keep MG4?

- No experience with MG5 or Universal Feynrules Output(UFO) format
  - Huge changes between MG4 and MG5
    - MG5 needs to take in Dark SUSY model customized in UFO format
  - Ideally need to start from FeynRules and produce a UFO model
  - Even with the UFO manual, we are(I am) struggling with customizing Dark SUSY model
  - Will be error-prone if we go with MG5 immediately this year
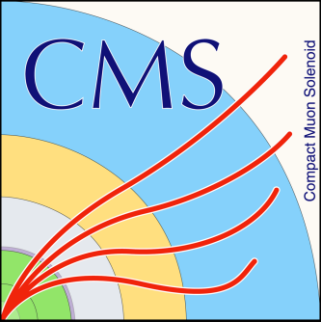 - Can work on MG5 while developing main analysis

Why keep MG4?

- Limited man power
  - Many major changes in the 2018 analysis, including the extension of search mass, final state, fiducial volume, etc
  - Validation of new procedures and generated samples(if we can generate) in MG5 also take time(unknown)
  - Want to focus on major changes with limited man power

Why keep MG4?

- MG4 recipe just finalized
  - All the recipes are available for MG4, just finalized in 2017
  - Will have a huge impact on our man power if need to start from scratch for MG5 in 2018

Why pLHE?

- Need to run separate script[1] to modify lifetimes to dark photons in pLHE files produced from MG4.
    - Reached out to Kennith Long, doing this in gridpack seems possible, but not easy
- Little change between LHE format from MG4 and MG5
- We went with pLHE in 2017 central MC production

[1]https://github.com/cms-tamu/MuJetAnalysis_DarkSusySamples_LHE_Generation/blob/master/replace_lifetime_in_LHE.py

Alternative

- We'd be happy to move to MG5 if…
  - Some real help is provided from UFO experts(especially) and MG5 expert
    - Efe once suggested me contacting UFO expert Benjamin Fuks, but the suggestion I get is referring to the UFO manual
  - Or better, some experts could help us customize the Dark SUSY model in MG5
- If not, that means I need to learn to use MG5 and UFO alone… ☹☹☹

BACK UP