Introduction

sPHENIX Heavy Flavor Topical Group Meeting, April 19, 2021

Hideki Okawa (Fudan)

Jin Huang (BNL)

General Information

- Further studies on MDC1 samples highly welcome! → More details by Cameron
  - Thanks to all the nice studies done so far: Zhaozhong Shi (MIT), Ming Liu (LANL), Han-sheng Li (Purdue), Sourav Tarafdar (Vanderbilt), Sebastian Tapia Araya (ISU), Dan Lis (Vertexing)
- Full list of topics: https://wiki.bnl.gov/sPHENIX/index.php/Heavy_Flavor_Topical_Group#Study_plans
- Recent HFTG status reports:
  - Hugo Pereira da Costa at APS GHP (Apr. 13-16, 2021): https://indico.jlab.org/event/412
  - 10th sPHENIX Collaboration Meeting (Jan. 21-22, 2021): https://indico.bnl.gov/event/10568
  - BUP (sPH-TRG-2020-001): https://indico.bnl.gov/event/9301/
- Upcoming conference/workshop talks
  - APS Mini-Symposium (Apr. 20): https://meetings.aps.org/Meeting/APR21/Session/X14
  - SQM-2021 (May 17-22): https://indico.cern.ch/event/985652/

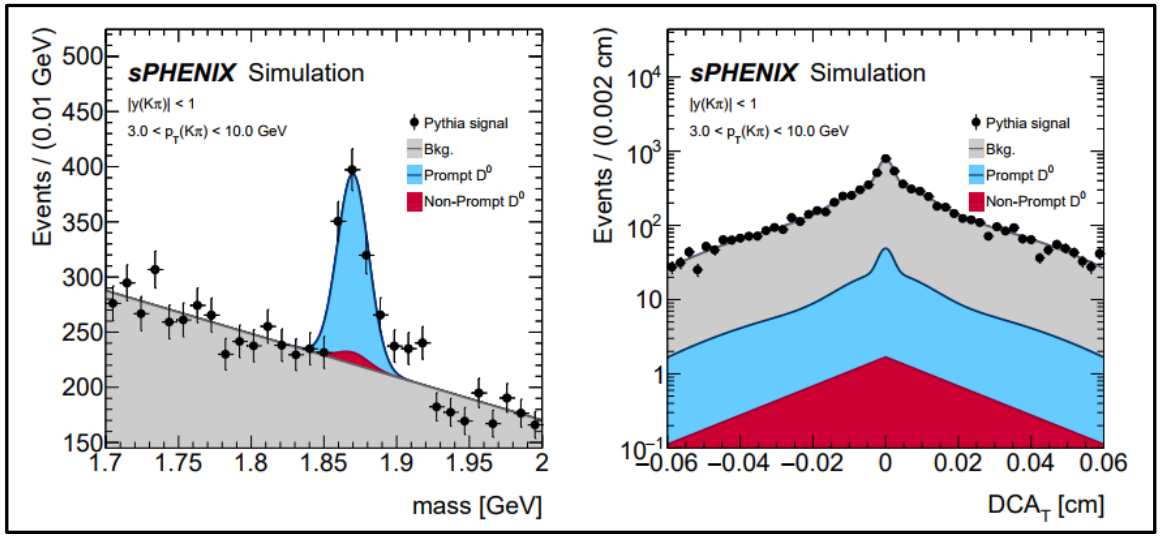
MatterMost

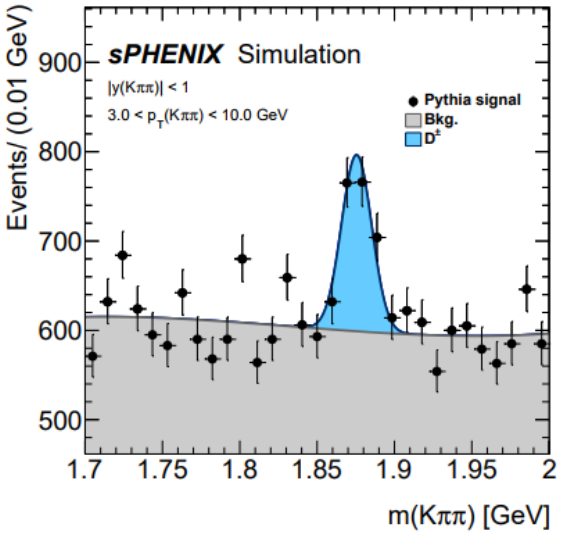
- **Lots of discussions are ongoing on Mattermost!** Please join the topics you are interested in. We can also create a new group if your topic is not there yet.
  - MDC1: https://chat.sdcc.bnl.gov/sphenix/channels/hf-mdc1
  - Λ_c: https://chat.sdcc.bnl.gov/sphenix/channels/hf-lc
  - HF jet track counting tagger: https://chat.sdcc.bnl.gov/sphenix/channels/hf-jet-tc-tagger
  - HF triggering (legacy): https://chat.sdcc.bnl.gov/sphenix/channels/hf-track-trigger
  - D^0 program in pp: https://chat.sdcc.bnl.gov/sphenix/channels/hf-d0
  - Bs: https://chat.sdcc.bnl.gov/sphenix/channels/hf-bs
  - D-D correlation: https://chat.sdcc.bnl.gov/sphenix/channels/hf-d0d0
  - KFParticle: https://chat.sdcc.bnl.gov/sphenix/channels/kfparticle
  - (related) Tracking QA: https://chat.sdcc.bnl.gov/sphenix/channels/tracking-qa
  - (related) Tracking software: https://chat.sdcc.bnl.gov/sphenix/channels/tracking-software

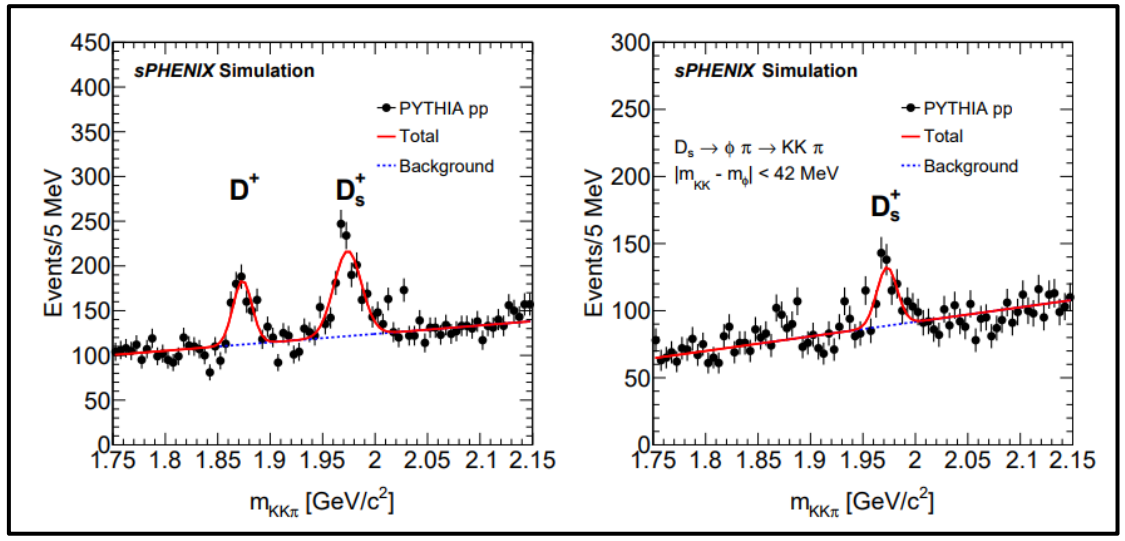
Approved Plots for APS GHP

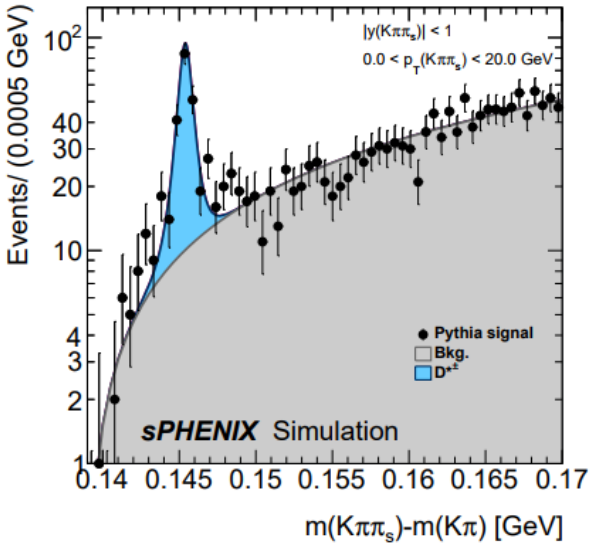
- We have a short technical note (sPH-HF-2021-001) approved to show some work-in-progress MDC1 plots at APS GHP: https://www.dropbox.com/s/jnysp682ivnauma/sPH-HF-2021-001.pdf?dl=0
- We'd like to emphasize that this is NOT the final MDC1 note, and was aimed to document that KFParticle is successfully integrated in the sPHENIX framework.
- Many other ongoing nice studies are cited in the references, and will be important components of the final MDC1 note that we hope to publish in the near future.
  - Pythia8 tuning studies: Sanghoon, Woohyeong, Long
  - MDC1 studies: Han-Sheng, Sourav et al.
- Please join our HFTG meetings & MDC1 tasks for the final MDC1 note.

Approved Plots for APS GHP









Today's Agenda

20:00 → 20:05 **Introduction** 5m

Speakers: Hideki Okawa (Fudan University) , Dr Jin Huang (Brookhaven National Lab)

20:05 → 20:25 **Development on HF tools** 20m

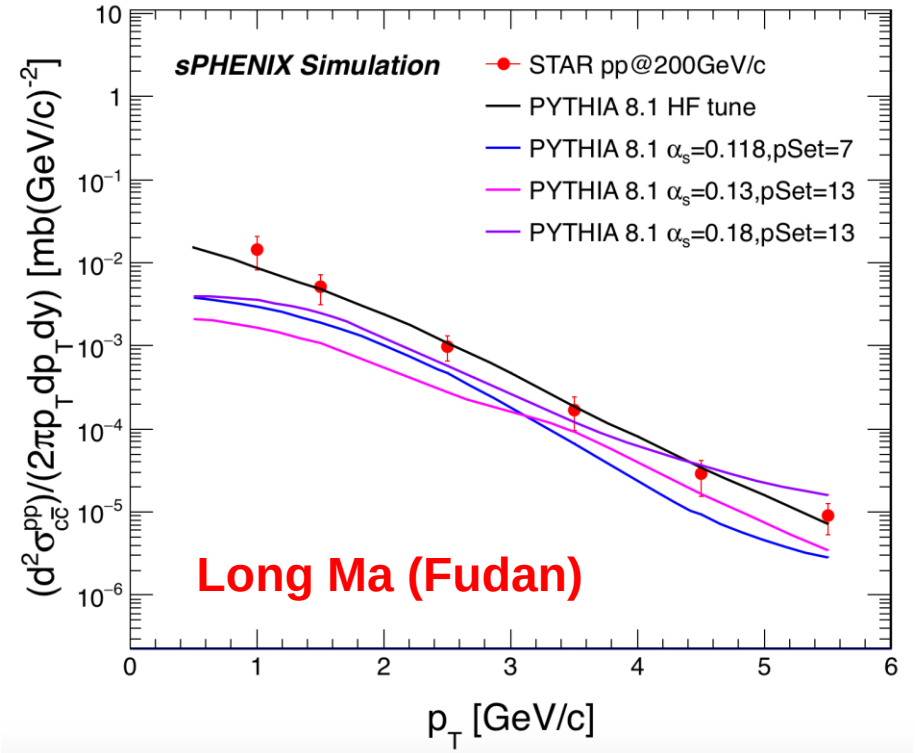
Speaker: Cameron Dean (LANL)

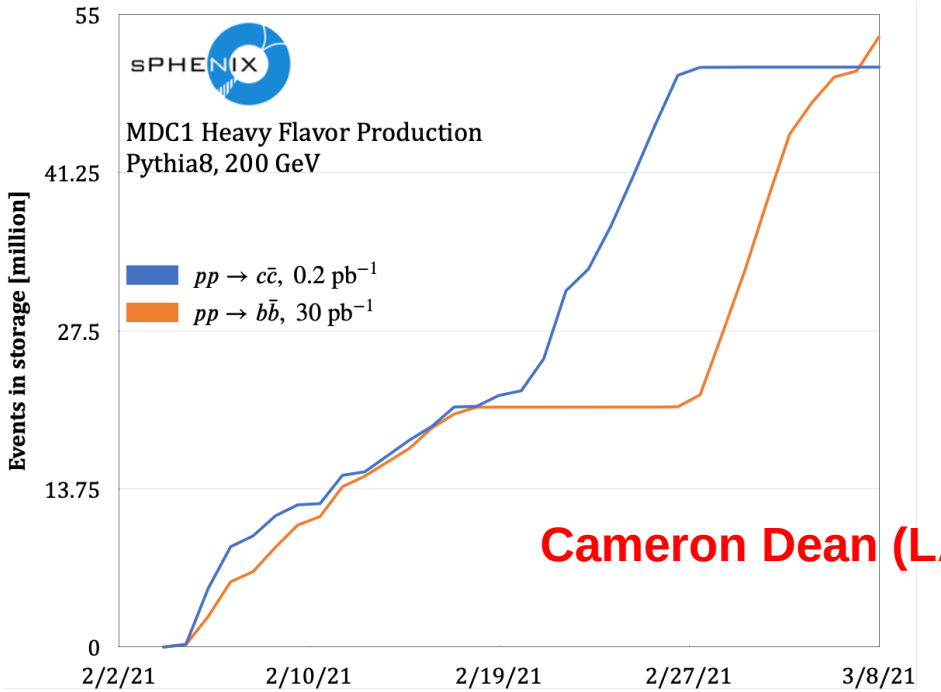
20:25 → 20:45 **Verbal updates on prompt-D0 and non-prompt D0 DCA distribution** 20m

Speaker: Han-Sheng Li (Purdue University)

Backup

For Software & Computing Review





Similar studies by Sanghoon Lim, Woohyeong Park (Pusan)

- Many plots provided to Camelia for the Software & Computing Review.
- Our MDC1 analyses will continue & go beyond the S&C review. We look forward to further updates.

Wishlist for Future Production (2021,2022)

From Camelia's talk at GM (Mar. 19)

	A	B	C	D
22	**TG**	**PYTHIA 2022 needs-- WITH PU**		**Embedding?**
23	HF	**ccbar**	50M	yes
24		**bbar**	50M	
25		**charm jet signal**	1M	
26		**bottom jet signal**	1M	
27		**D0(kpi)**	1M	
28		**D+(Kpipi)**	1M	
29		**Lc(piKp)**	1M	
30		**Psi(1s,2s)->mumu**	2M	
31		**B->DX**	5M	
32		**B->JpsiX**	3M	
33				
34		**directPhoton, MSEL=10**		
35	cQCD	qhat>0	100M	
36	Jets	ptTruth_photon [10,30] GeV	1M	yes
37		ptTruth_photon [10,30] GeV	1M	
38				
39		**MB QCD, MSEL=1**		
40	cQCD, HF	qhat>0	1B	→ Likely to be ~300M each
41		qhat>5GeV	1B	
42		no filtering	1M	
43	Jets, HF	ptTruth_jet [10,20]GeV	5M	yes
44		ptTruth_jet [20,40]GeV	5M	
45		ptTruth_jet>40GeV	1M	
46				
47	HF, Onia	Single track	6M	

- Discussions started at our last TG meeting & Cameron presented the plan at the simulation meeting: https://indico.bnl.gov/event/10504
- Further discussions ongoing with the computing team & will be reported at the S&C review: https://indico.bnl.gov/event/11083
- **Pythia jet samples for pp will be produced this year.**
  - **Inclusive: 10M**
  - **c-jets: 1M**
  - **b-jets: 1M**
- Pileup & embedding will be considered for the production in 2022.
- We can use the MB samples to validate our BG fastsim.