

Discussion and request for run 17 pp 510GeV st_fms MuDst files reproduce

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Requirement and current situation for run 17 FMS data

- Goal: diffractive EM-jet A_N for run 15 and run 17 FMS
 - Already got preliminary approval for run 15 FMS data set.
- Requirement: the events must include FMS detector and Roman Pot (RP) detector information.
- Current situation for run 17 pp 510GeV data:
 1. No RP information in FMS stream data.
 2. Very few events with FMS information in RP stream data.
- Reason:
 1. RP detector option not turned on in MuDst data production for st_fms stream
 2. FMS trigger detector on not included in RP triggers for RP stream.

Current run 17 st_fms data production chain

P18ic	rawData	SL18c	ry2017a	DbV20171001 pp2017a StiCA btof mtd mtdCalib PicoVtxDefault fmsDat fmsPoint fpsDat BEmcChkStat OSpaceZ2 OGridLeak3D	pp 510GeV run 2017 st_fms stream data production
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Run 17 fms stream

- We require the events contain both FMS and RP information.

Information for run: 18109033

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Trigger Info													
Run Info		Thresholds											
All Details	No Details	main	Requirements	Detectors	Overlaps	PS Setup	Emulation						
FMS-JP2 (history)		48	570828	329.92	3.45K	3.67K	1.0000	0.1250	fms				
FMS-JP2 (history) --> Requirements:		+FMS-JP2				L1: Accept		L2: Accept		L4: Accept			
		-Laser-protection											
		Detector	Require	Live	Require	Dead	Fire	Fire	If Live	Disable	If Present	Disable	If Not Present
		ETOF	0	0	0	0	0	0	0	0	0	0	0
		PP2PP	0	0	0	0	1	0	0	0	0	0	0
		ETOW	1	0	1	0	0	0	0	0	0	0	0
		BTOW	1	0	1	0	0	0	0	0	0	0	0
		BSMD	0	0	0	0	0	0	0	0	0	0	0
		TOF	1	0	1	0	0	0	0	0	0	0	0
		ESMD	1	0	1	0	0	0	0	0	0	0	0
		TPX	0	0	0	0	0	0	0	0	0	0	0
		FCS	0	0	0	0	0	0	0	0	0	0	0
		RHICF	0	0	0	0	0	0	0	0	0	0	0
		GMT	0	0	0	0	0	0	0	0	0	0	0
FMS-JP2 (history) --> Detectors:		MTD	0	0	0	0	0	0	0	0	0	0	0
		Trigger Detector						Require					
		trg-zdc						0					
		trg-bbc						0					
		trg-vpd						0					
		trg-tof						0					
		trg-epd						0					
		trg-mtd						0					
		trg-bemc						0					
		trg-eemc						0					
		trg-rp						0					
		trg-fms						1					
		fps						1					
		trg-fcal						0					

Possible to get Roman Pot information in fms stream.

Same situation for all other FMS triggers.

Run 17 rp stream

- We require the events contain both FMS and RP information.

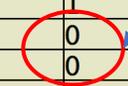
Information for run: 18109033

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No FMS trigger detector for RP triggers.

Same issue for all RP triggers.

Trigger Info		Run Info		Thresholds				
All Details	No Details	main	Requirements	Detectors	Overlaps	PS Setup	Emulation	
RP_CPT2 (history) --> Detectors:		TOF	1	0	1	0	0	1
		ESMD	1	0	1	0	0	0
		TPX	1	0	1	0	0	0
		FCS	0	0	0	0	0	0
		RHICF	0	0	0	0	0	0
		GMT	0	0	0	0	0	0
		MTD	1	0	1	0	0	0
		Trigger Detector						
trg-zdc							1	
trg-bbc							1	
trg-vpd							1	
trg-tof							1	
trg-epd							1	
trg-mtd							1	
trg-bemc							1	
trg-eemc							1	
trg-rp							1	
trg-fms							0	
fps							0	
trg-fcal							1	



Test for adding RP detector option in st_fms MuDst generation

- Follow the chain production from fast offline production.
 - Include both FMS and RP detector options.

DEV	rawData	DEV	ry2017	pp2017 btof mtd pp2pp fmsDat fmsPoint fpsDat BEmcChkStat CorrX OSpaceZ2 OGridLeak3D -hitfilt	Fastoffline chain for pp 500GeV run 2017
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- Use st_fms_18118002_raw_3000008.daq file as test.
 - We can see some events with both FMS and RP detector information.
 - Possible to consider reproducing st_fms stream MuDst files adding RP detector option.
 - Files for the test: /star/data01/pwg/liangxl/test_fmsMuDst/
- Check for the MuDst generation results

Total number of events for this file	126,622
Total number of events with RP response	7,060 (5.6%)
Number of events satisfying diffractive process	277 (0.2%)

Possibility for using run 17 FMS stream

- From Production MuDst Summary on Distributed Disk:

Trigger setup name	Stream name	Collision	Year of data taken	Production Tag	Number of Events on DD	Number of Events on HPSS	Size of MuDst on DD (GB)	Number of MuDst files on DD	Number of MuDst files on HPSS	% of production saved on DD
pp500_production_2017	st_fms	pp510	year2017	P18ic	7470577569	7909845375	152494	81194	87821	92.5
	st_fms_adc	pp510	year2017	P18ic	83385	95698	63.2	2118	2450	86.4

- There are about 7910 M event for this data set (fms stream).
- Should be feasible for diffractive EM-jet A_N analysis.

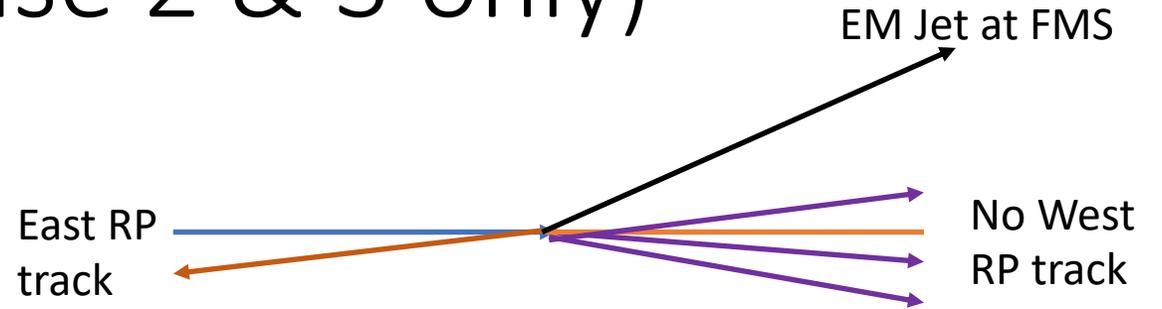
Discussion and Request

- Run 17 rp stream data do not contain FMS detector information.
- Run 17 fms stream data contain RP detector information. There are reasonable fraction of events with both FMS and RP detector information in the test MuDst file.
- We request to reproduce the MuDst files for st_fms stream with adding the RP detector (possibly add “pp2pp” option and turn on RP detector option when generating MuDst files).

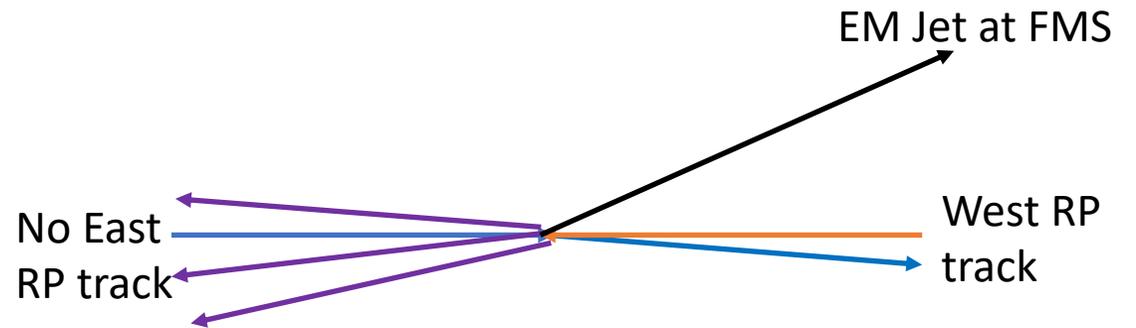
Back up

Diffraction process (case 2 & 3 only)

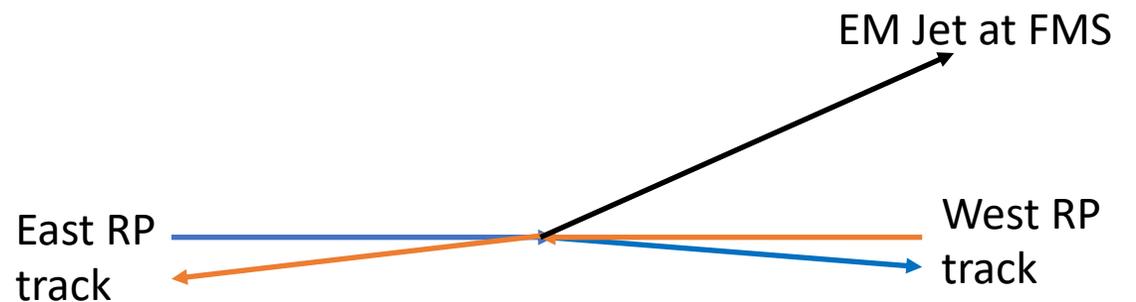
Case 1:
Single diffractive event: Only 1 proton track on east side RP.



Case 2:
Single diffractive event: Only 1 proton track on west side RP.



Case 3:
Double diffractive event: Only 1 proton track on east side RP and only 1 proton track on west side RP.



Run 15 FMS stream data

- The fraction of events with RP track in FMS stream data for run 15 and run 17 (from sample) is similar.

