SIDIS Background Rate Check between GEMC v1 and v2

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1, Photon Background from π0 Decay

GEMC v2 + Geant4.9.6

Note: No (theta>8.0) cut

(KHz)	LASPD	LAEC	LGC	HGC	FASPD	MRPC	FAEC
Target (e/g)	0.23/13.80	0.2/13.8	38.9/1.73e3	45.46/1.73e3	85.89/1.71e3	89.08/1.70e3	169.2/1.65M
Upstream(e/g)	0.36/17.04	0.4/17.02	0/0.82	0./0.82	0/0.81	0/0.81	0.01/0.02
DownStream(e/g)	0.05/9.17	0/9.2	3.49/49.60	3.63/49.36	4.18/48.95	4.08/49.05	0.6/4.8

GEMC v2 + Geant4.9.5

(KHz)	GEMC v1 +Geant4.9.5 LAEC	LAEC	LGC	GEMC v1 +Geant4.9.5 LGC		GEMC v1 +Geant4.9.5 FAEC	FAEC
Target (e/g)	0/10.20	0/14.85	39.6/1.78e3	36.70/1.95e3		196.3/3.0e3	165.6/1.70e3
Upstream(e/g)	0/8.2	0/9.5	4.47/51.78	0/0.5		0/3.0	0.67/5.22
DownStream(e/g)	0/0	0/9.3	4.38/50.74	3.0/37.0		9.0/88.0	0.64/5.02

1, Photon Background from π0 Decay

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(KHz)	LASPD	LAEC	LGC	HGC	FASPD	MRPC	FAEC
Target (e/g)	0.23/13.80	0.2/13.8	38.9/1.73e3	45.46/1.73e3	85.89/1.71e3	89.08/1.70e3	169.2/1.65M
Upstream(e/g)	0.36/17.04	0.4/17.02	0/0.82	0./0.82	0/0.81	0/0.81	0.01/0.02
DownStream(e/g)	0.05/9.17	0/9.2	3.49/49.60	3.63/49.36	4.18/48.95	4.08/49.05	0.6/4.8

GEMC v2 + Geant4.9.5

(KHz)	GEMC v1 +Geant4.9.5 LAEC	LAEC	LGC	GEMC v1 +Geant4.9.5 LGC	GEMC v1 +Geant4.9.5 FAEC (Zhiwen's)	GEMC v1 +Geant4.9.5 FAEC	FAEC
Target (e/g)	0/10.20	0/14.85	39.6/1.78e3	36.70/1.95e3	192/2.83e3	196.3/3.0e3	165.6/1.70e3
Upstream(e/g)	0/8.2	0/9.5	4.47/51.78	0/0.5	0.30/4.85	0/3.0	0.67/5.22
DownStream(e/g)	0/0	0/9.3	4.38/50.74	3.0/37.0	9.7/95.2	9.0/88.0	0.64/5.02

3, EM Background

All "0.0 KHz" after the EC cut

3, eDIS Events

(eDIS) GEMC v2 + Geant4.9.6

(KHz)	LASPD	LAEC	LGC	FAEC
Target/up/ down	3.97/3.86/2.34	3.99/3.86/2.36	75.87/1.64/1.94	75.87/1.64/1.94

Zhiwen's (eDIS) GEMC v1 + Geant4.9.5

(KHz)	LASPD	LAEC	LGC	FAEC
Target/up/ down		4.7/4.17/2.81		70.5/1.46/2.24

3, Pion Events

GEMC v2 + Geant4.9.6

	(KHz)	LASPD	LAEC	FASPD	FAEC
Pi+	Target/up/ down	3.31/3.74/1.82	3.32/3.75/1.83	779.01/132.96/251.12	780.72/138.15/255.02
Pi-	Target/up/down	3.45/3.87/2.01	3.44/3.87/2.02	686.70/134.02/249.69	691.02/138.93/254.52
Zhiwen's			25.7 KHz (12.9+12.8)		2.62e3 KHz (1.25e3+1.37e3)
Total			18.23 KHz		2.26e3 KHz

4, Proton Events

	(KHz)	LASPD	LAEC	FASPD	FAEC
Proton	Target/up/ down	9.60/10.35/4.73	9.63/10.37/4.76	998.90/204.73/314.75	1005.87/205.90/316.35
Zhiwen's			5.28 KHz		273 KHz
Total			24.76 KHz		1.53e3 KHz

42.99 KHz (Zhiwen's = 31.1 KHz)

3.79e3 KHz (Zhiwen's = 2.90e3 KHz)

Single Rate:

FAEC: Single Trigger:
1, eDIS at FAEC (T/u/d): 75.87+1.64+1.94 = 79.45 KHz
2, e at LGC (T/u/d): 38.9 + 3.49 +3.49 = 45.88 KHz
(note: geant4.9.6 give 0kHz for "up", I use "down" values since they should be close)
3, e at FAEC (T/u/d): 169.2 + 0.6 + 0.6 – 45.88 (from LGC) = 124.52/40=3.11KHz, where 40 is for 3 sectors
(note: same as above, let "up" and "down" equal so far)
4, Photon t FAEC (T/u/d): (1.65e3 + 4.8 + 4.8)/20/40 = 2.07 KH, where 20 is for photon-rejection from SPD+MRPC
5, Hadron random coincident: 3.79e3/2/40 = 47.38 KHz
6, Hadron Correlation coincident: 3.79e3/2/ 55 = 34.45 KHz

Rate = 79.45 + 0.4 * (45.88 + 3.11 + 2.07 + 47.38 + 34.45) = 132.61 KHz, where 0.4 is the norm. factor from Wiser code.
(Zhiwen's July value, Rate = 129.7 KHz)

LAEC: Single Trigger:
1, eDIS at LAEC (T/u/d): 3.99 + 3.86 + 2.36 = 10.21 KHz
2, e at LAEC (T/u/d): 0.2 + 0.4 + 0. = 0.6 KHz
3, photon at LAEC (T/u/d): 13.8 + 17.02 + 9.2 = 40.02 / 10 = 4.0 KHz, where 10 is the photon-rejection factor from LASPD
4, Hadron: 42.99 KHz

Rate = 10.21 + 0.4 * (0.6 + 4.0 + 42.99) = 29.25 KHz (Zhiwen's July value, Rate = 25.5 KHz)