

## PrimEx production (Phase I)

(02/21/2019 - 04/14/2019)

**Beam Energy:** 11.2 GeV for most runs (11.6 GeV used in the beginning, production on Be)  
**Beam current:**  $10^{-4} X_0$   
**Converter:** 750  $\mu\text{m}$  Be

**Setup:** hd\_all.tsg\_ccal\_prod  
**Configuration:** CCAL\_FCAL\_PS\_m9 (m10)

**Begin of run:** 02/21 6 pm

**End of run:** 04/14 6 am

**Run duration:** 52.5 days

**Accelerator efficiency:** 58.3 % (see table below)

**PAC equivalent, not corrected to account for smaller beam energy:** 30.6 days

**PAC equivalent, corrected to account for smaller beam energy:**  $30.6 * 0.72 = 22$  days  
(assume energy correction coefficient of 0.72)

### RUN SUMMARY

	He empty	He target		Be target	Be empty
	885	470		2789	231
	1085	1257			412
	434	13189			
	476	5210			
	408	7146			
		9056			
		3663			
		979			
Total (M)	3288	40970		2789	643

Production on Be target

Run	Date	Events (M)	Current	Target	PS (A)	Comments	Files	PS pairs (M)
61321	26-Feb	226	200 nA	Be	850		43	39.66 +
61322		68					13	11.79 +
61323		212					40	37.02 +
61325		74					14	11.94 +
61327		94					18	16.65 +
61329		215					41	37.98 +
61330		228					43	40 +
61331		230					43	40.15 (file 8)
61332		218					41	38.16 +
61333		172					33	29.23 +
61334		37					7	6.28 +
61335		113					21	19.69 +
61336		122					23	21.47 +
61337		86					16	15.28 +
61340		19					4	3.39 +
61341		143					27	25.61 +
61342		195					37	33.81 (0,1,2,3,4)
61343		179					34	31.71
61344		158					30	27.98
Total		2789						59.69

First empty target run (no target cell)

Run	Date	Events (M)	Current	Target	PS (A)	Comments
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61309	25-Feb	81	200 nA	Empty	910	
61310	2:08	100		no cell		
61311		50				

Total 231

**Empty target run (no target cell)**

Run	Date	Events (M)	Current	Target	PS (A)	Comments
61345	28-Feb	62	200 nA	Empty	850	
61346	13:00	58		no cell		
61347		62				
61348		49				
61349		31				
61350		20				
61352		50				
61353		56				
61354		24				

Total 412

**Empty target run (LHe cell installed)**

Run	Date	Events (M)	Current	Target	PS (A)	Comments
61357	2-Mar	21	200 nA	Empty	850	
61358		60				
61359		46				
61360		25				
61361		53				
61362		55				
61363		55				
61364		54				
61365		64				

61366		66				
61367		56				
61368		64				
61369		41				
61370		3 M				raw mode
61371		46				
61372		53				
61373		43				
61374		42				
61375		41				
Total		885				

**Filling cell with He (LHe cell installed)**

Run	Date	Events (M)	Current	Target	PS (A)	Comments
61377	4-Mar	35	200 nA	Filling	850	

**Production on He target**

Run	Date	Events (M)	Current	Target	PS (A)	Comments
61378	4-Mar	236	200 nA	He	850	
61379		41				
61391		193				
Total		470				

**Beam Energy change from 11.6 GeV to 11.2 GeV**

**Production on He target**

Run	Date	Events (M)	Current	Target	PS (A)	Comments
61434	8-Mar	16	200 nA	He	850	Check target/beam
61435		92				stability
61436		16				
61437		120				
61439		13				
61441		135				
61442		161				
61443		143				
61444		159				
61445		155				
61446		185				
61447		62				
Total		1257				

Unmask FCAL, add separate triggers for CCAL and FCAL

Run	Date	Events (M)	Current	Target	PS (A)	Comments
61462	9-Mar	102	200 nA	He	850	CDC added
61465		159				exclude CDC
61466		147				problems with
61467		175				RootSpy
61468		173				
61469		168				
61470		171				
61471		166				
61472		171				
61473		168				
61474		67				
61475		40				
61476		178				
61477		172				
61478		168				

61479		186				
61480		104				
61481		15				
61482		201				
61483		175				
61484		189				
61485		176				
61486		176				
61487		133				
61488		158				
61489		173				
61490		159				
61491		166				
61493		181				
61494		169				
61495		179				
61496		159				
61497		146				
61498		176				
61499		160				
61500		173				
61501		175				
61502		173				
61503		82				
61504		92				
61505		72				
61506		143				
61507		34				
61508		133				Reset HV, bad ch
61509		175				
61510		174				
61511		176				
61512		177				
61513		118				

61514		160				
61515		172				
61516	14-Mar	50				
61517		165				
61518		167				
61519		158				
61522		105				
61523		126				
61524		83				
61525		103				
61526		221				
61527		27				
61528		87				
61529		176				
61530		190				
61531		154				
61532		159				
61533		37				
61534		45				
61537		120				
61538		47				
61539		44				
61546		160				
61547		158				
61548		171				
61549		168				
61550		137				
61551		53				
61553		161				
61554		167				
61555		158				
61556		160				
61557		151				
61558		152				

61559		160				
61560		156				
61561		162				
61562		141				
61563		162				
61564		153				
61565		160				
61566		157				
61567		142				
61568	17-Mar	101				

Total 13189

Empty He target

Run	Date	Events (M)	Current	Target	PS (A)	Comments
61576	17-Mar	71	200 nA	Empty	850	
61577		26				
61578		62				
61579		73				
61580		70				
61581		67				
61582		67				
61583		64				
61584		65				
61585		39				

Break

61602		68				
61603		67				
61606		69				
61607		43				
61608		71				
61609		70				
61610		67				
61611		26				



Total

1085

Production on He target

Run	Date	Events (M)	Current	Target	PS (A)	Comments
61621	21-Mar	56	200 nA	He	850	not stable beam
61622		128				
61624		159				
61626		159				
61627		162				
61628		60				
61629		134				
61630		161				
61631		152				
61632		154				
61634		122				
61635		160				
61636		140				
61637		121				
61638		103				
61639		94				
61640		110				
61642		152				
61643		146				
61644		137				
61645		158				
61646		160				
61647		156				
61648		165				
61649		157				
61650		90				
61651		118				
61652		157				
61654		62				

61655		159				
61656		146				
61657		149				
61658		161				
61659		169				
61660		59				
61661		168				
61662		150				
61663		162				
61664		54				

Total 5210

Empty He target

Run	Date	Events (M)	Current	Target	PS (A)	Comments
61668	24-Mar	65	200 nA	Empty	850	20:00
61669		63				
61670		65				
61671		65				
61672		58				
61673		60				
61686		16				unstable beam
61687		42				

Total 434

Production on He target

Run	Date	Events (M)	Current	Target	PS (A)	Comments
61690	26-Mar	31	200 nA	He	850	14:20
61691		140				
61692		157				

61694		165				
61695		117				
61697		176				
61698		162				
61699		172				
61700		19				
61701		62				
61702		151				
61703		96				
61704		110				
61705		149				
61706		143				
61707		117				
61709		95				
61710		82				
61711		90				
61712		150				
61713		139				
61715		93				
61717		136				
61718		127				
61719		120				
61720		53				
61722		120				
61723		52				
61727		104				
61728		103				
61729		37				
61731		140				
61732		153				
61734		146				
61735		148				
61736		154				
61737		90				

61738		121				
61739		154				
61740		36				
61741		148				
61742		162				
61743		134				
61744		60				
61745		124				
61746		143				
61747		141				
61748		18				
61749		118				
61750		148				
61751		134				
61752		137				
61753		123				
61754		157				
61755		133				
61756		75				
61757		137				
61758		146				
61759		140				
61760		68				
61763		90				

Total 7146

Empty He target

Run	Date	Events (M)	Current	Target	PS (A)	Comments
61764	1-Apr	67	200 nA	Empty	850	21:22
61765		64				
61766		71				
61767		56				

61768		57				
61769		63				
61771		66				
61772		32				
Total		476				

Production on He target

Run	Date	Events (M)	Current	Target	PS (A)	Comments
61774	2-Apr	41	200 nA	He	850	16:42
61775		181				
61777		84				
61778		11				
61779		158				
61780		157				
61781		156				
61782		142				
61783		142				
61785		17				
61786		127				
61788		151				
61789		147				
61790		148				
61791		121				
61792		156				
61793		149				
61794		154				
61795		160				
61796		161				

61797		182				
61798		160				
61799		73				
61800		26				
61802		67				
61803		165				
61804		149				
61805		153				
61806		74				
61807		146				
61808		151				
61809		153				
61810		140				
61811		161				
61812		165				
61813		147				
61814		155				
61815		88				
61816		143				
61817		152				
61818		175				
61821		113				
61823		136				
61825		134				
61826		156				
61827		140				
61828		165				
61829		154				
61830		142				
61831		146				
61832		146				
61833		150				
61834		132				
61835		71				

61836		140				
61837		140				
61838		125				
61839		39				
61840		155				
61841		175				
61842		140				
61843		158				
61844		153				
61845		151				
61846		153				
61847		145				
61848		115				
61849		35				
61850		59				

Total 9056

Empty He Target

Run	Date	Events (M)	Current	Target	PS (A)	Comments
61852	8-Apr	21	200 nA	Empty	850	18:40
61854		56				
61855		38				
61856		57				
61857		23				
61858		52				
61859		30				
61860		49				
61861		50				
61862		32				
61863		41				Filling target

Total 408

Production on He target

Run	Date	Events (M)	Current	Target	PS (A)	Comments
61866	9-Apr	135	200 nA	He	850	16:00
61867		139				
61868		27				
61874		140				
61875		141				
61876		133				
61877		41				
61878		130				
61879		165				
61880		133				
61881		92				
61882		114				
61883		55				
61884		138				
61885		158				
61887		166				
61888		161				
61889		155				
61890		151				
61891		150				
61892		148				
61893		152				
61894		163				
61895	11-Apr	65				
61905		139				
61906		144				
61908		146				
61909		144				
61910		38	200 nA			

Total

3663



Production on He target (small current, include FDC at 50 nA)

Run	Date	Events (M)	Current	Target	PS (A)	Comments
61914	12-Apr	32	50 nA	He	850	Include FDC
61915	10:00 AM	35	50 nA			Include FDC
61916		23	50 nA			Include FDC
61917		36	50 nA			Include FDC
61918		10	50 nA			Include FDC
61930		36	50 nA			Include FDC
61931		10	50 nA			Include FDC
61933		27	50 nA			Include FDC
61934		35	50 nA			Include FDC
61935		38	50 nA			Include FDC
61936		42	50 nA			Include FDC
61937		35	50 nA			Include FDC
61938		33	50 nA			Include FDC
61939	13 - Apr 18:00	38	50 nA			Include FDC
61947		35	100 nA			
61950		85	100 nA			
61951		83	100 nA			
61952		86	100 nA			
61953		83	100 nA			
61954		14	100 nA			
61955		87	100 nA			
61956		76	100 nA			

12	11 bad
14	8.8 +
9	5.69 +
14	9.01 +
4	2.57 +
14	11 bad
4	2.55 +
11	6.64 +
13	8.73 +
15	9.59 +
16	10.44 +
13	9 bad
13	8.13 +
15	9.64 +

Total 979

61540		24				Trigger studies
61542		121				
61543		38				
61545		154				

### Accelerator Efficiency

		ABU (hours)	Total (hours)	Efficiency (%)
21-Feb		254	480	
22-Feb		855	1440	
23-Feb		1342	1480	
24-Feb		1074	1480	
25-Feb		604	1480	
26-Feb		558	1480	
27-Feb		692	1480	
28-Feb		781	1480	
1-Mar		241	1480	
2-Mar		191	1480	
3-Mar		911	1480	
4-Mar		585	1480	
5-Mar		128	1480	
6-Mar		0	1480	
7-Mar		0	1480	
8-Mar		265	1480	
9-Mar		1099	1480	
10-Mar		1238	1480	
11-Mar		1063	1480	
12-Mar		1209	1480	
13-Mar		1211	1480	
14-Mar		972	1480	

15-Mar		1004	1480	
16-Mar		1202	1480	
17-Mar		1130	1480	
18-Mar		1145	1480	
19-Mar		1087	1480	
20-Mar		369	1480	
21-Mar		630	1480	
22-Mar		1092	1480	
23-Mar		1137	1480	
24-Mar		1239	1480	
25-Mar		509	1480	
26-Mar		626	1480	
27-Mar		906	1480	
28-Mar		808	1480	
29-Mar		629	1480	
30-Mar		1110	1480	
31-Mar		1136	1480	
1-Apr		554	1480	
2-Apr		1021	1480	
3-Apr		1078	1480	
4-Apr		1084	1480	
5-Apr		1125	1480	
6-Apr		1151	1480	
7-Apr		1239	1480	
8-Apr		617	1480	
9-Apr		1048	1480	
10-Apr		1237	1480	
11-Apr		988	1480	
12-Apr		973	1480	
13-Apr		1136	1480	
14-Apr		940	1480	
15-Apr		156	480	

45379

77880

58.26784797