

SLAC - PEP-II Run Statistics

FY2003 Totals - PEP run								
	BaBar	PEP Mach. Dev.	Tuning & Injection	Unsched. Down	Sched. Off	Total hours	Data delivered to BaBar (fb-1)	Data recorded BaBar (fb-1)
Q1 hours	288.9	60	282.4	235.8	1316.9	2184	1.6	1.3
Q2 hours	1314.3	89.7	431.1	219.8	129.1	2184	17.6	17.1
Q3 hours	1146.4	161.6	413.7	414.5	46.8	2183	18.7	17.0
Q4 hours	157.6	19.5	249.4	113.1	1644.4	2184	2.0	2.0
FY2003 Total hours	2907.2	330.8	1376.6	983.2	3137.2	8735	39.9	37.3
(% of total hrs.)	33.3%	3.8%	15.8%	11.3%	35.9%			
Exclude All Sched. Off (% of Sched. On hrs.)	51.9%	5.9%	24.6%	17.6%		5597.8		

FY2004 Totals - PEP run								
	BaBar	PEP Mach. Dev.	Tuning & Injection	Unsched. Down	Sched. Off	Total hours	Data delivered to BaBar (fb-1)	Data recorded BaBar (fb-1)
Q1 hours	1199	118.4	420.2	239.1	208.3	2185	21.7	20.5
Q2 hours	1381.7	144.8	408.4	195.5	52.6	2183	30.9	29.6
Q3 hours	1578.2	84	225.1	281.9	14.8	2184	44.8	43.1
Q4 hours	510.8	2.6	71.8	58.9	1539.9	2184	17.0	16.1
FY2004 Total hours	4669.7	349.8	1125.5	775.4	1815.6	8736	114.4	109.4
(% of total hrs.)	53.5%	4.0%	12.9%	8.9%	20.8%			
Exclude All Sched. Off (% of Sched. On hrs.)	67.5%	5.1%	16.3%	11.2%		6920.4		

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FY2005 Totals - PEP run								
	BaBar	PEP Mach. Dev.	Tuning & Injection	Unsched. Down*	Sched. Off	Total hours	Data delivered to BaBar (fb-1)	Data recorded BaBar (fb-1)
Q1 hours	0	0	0	1736	448	2184	0.0	0.0
Q2 hours	0	0	0	1936	248	2184	0.0	0.0
Q3 hours	1000.6	59.9	466.5	594.6	62.4	2184	17.0	15.7
Q4 hours	1475	106.6	286.2	289.9	26.3	2184	36.5	35.4
FY2005 Total hours	2475.6	166.5	752.7	4556.5	784.7	8736	53.5	51.1
(% of total hrs.)	28.3%	1.9%	8.6%	52.2%	9.0%			
Exclude All Sched. Off (% of Sched. On hrs.)	31.1%	2.1%	9.5%	57.3%		7951.3		

* FY2005 Q1 and Q2 includes directed off for lab-wide investigation, review, and remediation of safety concerns, and re-validation of all systems and procedures.

FY2006 Totals - PEP run								
	BaBar	PEP Mach. Dev.	Tuning & Injection	Unsched. Down	Sched. Off	Total hours	Data delivered to BaBar (fb-1)	Data recorded BaBar (fb-1)
Q1 hours	789.9	46.9	299.5	155.8	891.9	2184	19.1	18.4
Q2 hours	1077.6	86.3	280.1	272.3	466.7	2183	16.8	16.6
Q3 hours	1316.8	14.8	255.9	465.5	131	2184	35.9	35.4
Q4 hours	817.2	27.4	118.3	205.1	1016	2184	28.5	27.6
FY2006 Total hours	4001.5	175.4	953.8	1098.7	2505.6	8735	100.3	98.0
(% of total hrs.)	45.8%	2.0%	10.9%	12.6%	28.7%			
Exclude All Sched. Off (% of Sched. On hrs.)	64.2%	2.8%	15.3%	17.6%		6229.4		

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FY2007 Totals - PEP run								
	BaBar	PEP Mach. Dev.	Tuning & Injection	Unsched. Down	Sched. Off	Total hours	Data delivered to BaBar (fb-1)	Data recorded BaBar (fb-1)
Q1 hours	0	0	0	0	2185	2185	0.0	0.0
Q2 hours	998	29.7	412.3	235.5	483.5	2159	23.0	22.1
Q3 hours	1076.4	40.8	315.8	565.1	185.9	2184	29.9	28.8
Q4 hours	1096.4	39.8	213	180.3	678.5	2208	37.3	35.6
FY2007 Total hours	3170.8	110.3	941.1	980.9	3532.9	8736	90.2	86.5
(% of total hrs.)	36.3%	1.3%	10.8%	11.2%	40.4%			
Exclude All Sched. Off (% of Sched. On hrs.)	60.9%	2.1%	18.1%	18.9%		5203.1		

FY2008 Totals - PEP run								
	BaBar	PEP Mach. Dev.	Tuning & Injection	Unsched. Down	Sched. Off	Total hours	Data delivered to BaBar (fb-1)	Data recorded BaBar (fb-1)
Q1 hours	241.6	1.3	150.9	106.8	1707.4	2208	4.6	4.5
Q2 hours	1541.1	20.4	279.1	282.7	59.7	2183	49.4	47.0
Q3 hours	119.4	23	26.7	21.4	2009.5	2200	3.2	2.4
Q4 hours	0	0	0	0	2208	2208	0.0	0.0
FY2008 Total hours	1902.1	44.7	456.7	410.9	5984.6	8799	57.2	53.9
(% of total hrs.)	21.6%	0.5%	5.2%	4.7%	68.0%			
Exclude All Sched. Off (% of Sched. On hrs.)	67.6%	1.6%	16.2%	14.6%		2814.4		

Down time:

Scheduled down time includes prearranged outages for safety certifications, maintenance, new installations, software upgrades, RF processing, and magnet standardization. Unscheduled down time includes all periods when the scheduled program cannot be carried out due to a problem that cannot be fixed by beam tuning and is usually related to broken (or otherwise malfunctioning) hardware or software or an unexpected power outage.

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Integrated luminosity:

The number of particle events that PEP-II delivers to BaBar is the product of three quantities: the physics cross-section, the luminosity and the time duration. The physics cross-section for e+e- collisions to produce a BOB0 pair is determined by nature and has a value of about 1000 picobarns ($1 \text{ pb} = 1 \times 10^{-36} \text{ cm}^2$). The luminosity is the product of the number of particles in each of the opposing beams and the frequency of beam-crossings, and is inversely proportional to the cross-sectional areas of the beams. The luminosity is derived from accelerator parameters and has units of $1/\text{cm}^2\text{s}$. The integrated luminosity is the sum of the products of the instantaneous luminosity and the time intervals.

Once every minute, the luminosity in PEP-II is measured automatically. The resulting measurements are summed to derive the integrated luminosity. The integrated luminosity over a shift, day, week, or month is often reported to indicate the average accelerator performance. Thus, in a day when PEP-II delivers 500 pb^{-1} , BaBar would record about 500,000 BOB0 pairs