

Chapter 3 Storage Ring Operation

The SPring-8 accelerator systems have continued to develop and mature for a more stable synchrotron radiation (SR) source. For 2003, synchrotron radiations had been delivered to beamlines for over 5,000 hours. Regarding user time, the average rate of downtime for failure since 1997 is 2.4 %, and the SR availability in SPring-8 is higher than 97 %. In May, 2004, SPring-8 started top-up operation to deliver constant x-ray beams to users.

Table 3-1 SPring-8 storage ring operations (1997B-2003B).

Research Term	Period	Scheduled	Operational		
		Storage Ring Operation Time (hours)	User Time (hours)	Downtime for failure (Rate) (hours (%))	Machine Study, Beamline Study & Beamline Tuning (hours)
1997B	October 1997 - March 1998	1932.0	1286.0	32.0 (1.7)	614.0
1998A	April 1998 - October 1998	2674.0	1700.5	73.5 (2.7)	900.0
1999A	November 1998 - June 1999	3555.3	2584.5	71.6 (2.0)	899.2
1999B	September 1999 - December 1999	2117.2	1371.1	21.2 (1.0)	724.9
2000A	January 2000 - June 2000	2756.5	2051.0	55.0 (2.0)	650.5
2000B	October 2000 - January 2001	2645.2	1522.4	35.7 (1.3)	1087.1
2001A	February 2001 - June 2001	2696.4	2313.0	68.2 (2.5) ⁽ⁱ⁾	315.2
2001B	September 2001 - February 2002	2788.7	1867.1	26.1 (0.9)	895.5
2002A	February 2002 - July 2002	2795.2	2093.4	161.3 (5.8) ⁽ⁱⁱ⁾	540.5
2002B	September 2002 - February 2003	2665.9	1867.5	27.4 (1.0)	771.0
2003A	February 2003 - July 2003	2748.9	2245.9	32.7 (1.2)	470.3
2003B	September 2003 - February 2004	2823.0	1843.8	171.2 (6.1) ⁽ⁱⁱⁱ⁾	808.0
Total		32198.3	22746.2	775.9 (2.4)	8676.2

User Time: Actual beam time for users

(Storage Ring Operation Time) = (User Time) + (Downtime) + (Machine Study, Beamline Study & Beamline Tuning)

(Downtime Ratio) = (Downtime) / (Storage Ring Operation Time)

(Scheduled User Time) = (User Time) + (Downtime)

⁽ⁱ⁾: Storage ring trouble (RF C-station, vacuum trouble), 2001/6/24 (36:12)

⁽ⁱⁱ⁾: Storage ring trouble (ID22, vacuum trouble), 2002/6/20 (134:29)

⁽ⁱⁱⁱ⁾: Linac trouble (electron gun trouble), 2003/9/18 (31:59)

Storage ring trouble (broken injection vacuum chamber), 2003/10/5 (119:37)

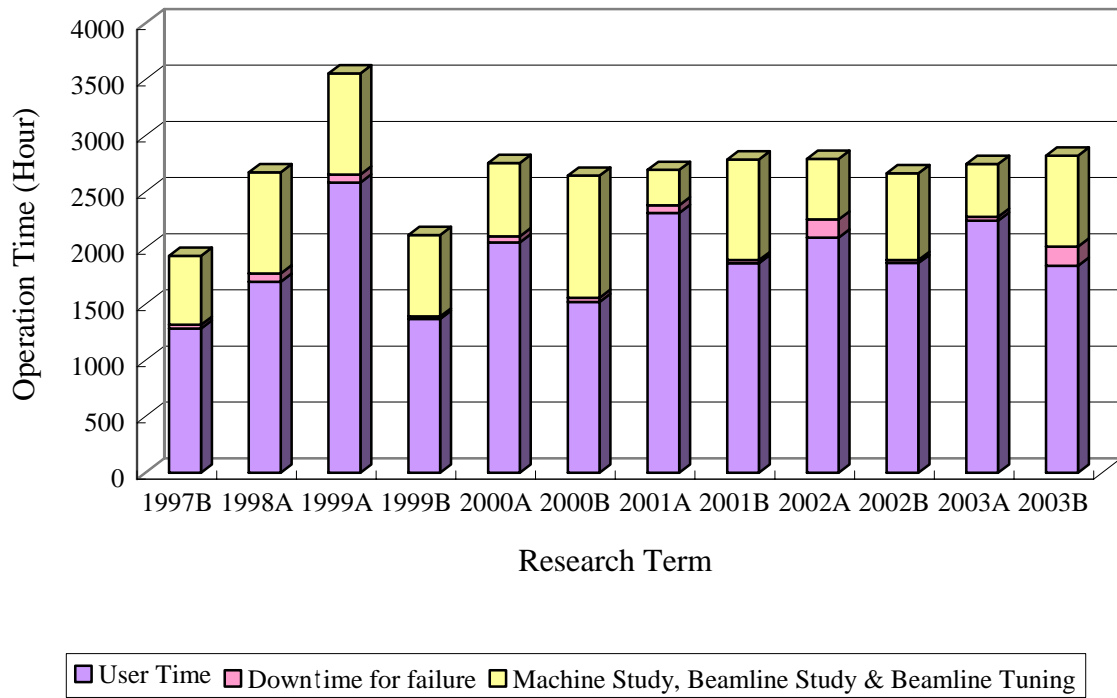


Figure 3-1 SPring-8 storage ring operations (1997B-2003B).