

Machine Operation

The operation statistics since, which have been collected the facility was opened to users are shown in Fig. 1. Recently, the SPring-8 storage ring has been operated on four- or five-week periods for one operation cycle. Since 2004, long-term operation cycles have also been performed. In 2006, the total operation time of the accelerator complex was 5026.2 hours. The operation time of the storage ring was 5008.5 hours, of which 75.7% (3790.1 hours) was made available to users. The downtime resulting from failure accounted for 1.1% (42.5 hours) of the operation time of the storage ring; in 2006, no great loss of user time exceeding several hours occurred. Since 2004, there has been no injection time because top-up injection was being introduced. Concerning user service operation, high availability (ratio of net user time to planned user time) was achieved, e.g., 98.7% in 2006. A total tuning and study time of

1193.6 hours was used for machine tuning, and the study of the linac, booster synchrotron and storage ring, and also used for beamline tuning and study.

Operations in three different filling modes were provided for the following user time percentages: 8.8% in the multi-bunch mode, 56.4% in the several bunch mode, such as the 203-bunch mode (203 equally spaced bunches) and 34.9% in the hybrid filling mode such as a 2/21- partially filled multi-bunch with 18-isolated bunches. In 2006, the use of the several bunch mode increase in frequency. In particular, the 203-bunch mode accounted for 36.3% of the total user time. For the hybrid filling mode, a current of 0.8 mA, 1.0 mA, 1.5 mA, or 1.8 mA is stored in each isolated bunch. An isolated bunch purity of better than 10^{-9} is routinely maintained in the top-up operation.

Table I presents a summary of useful beam parameters of the storage ring.

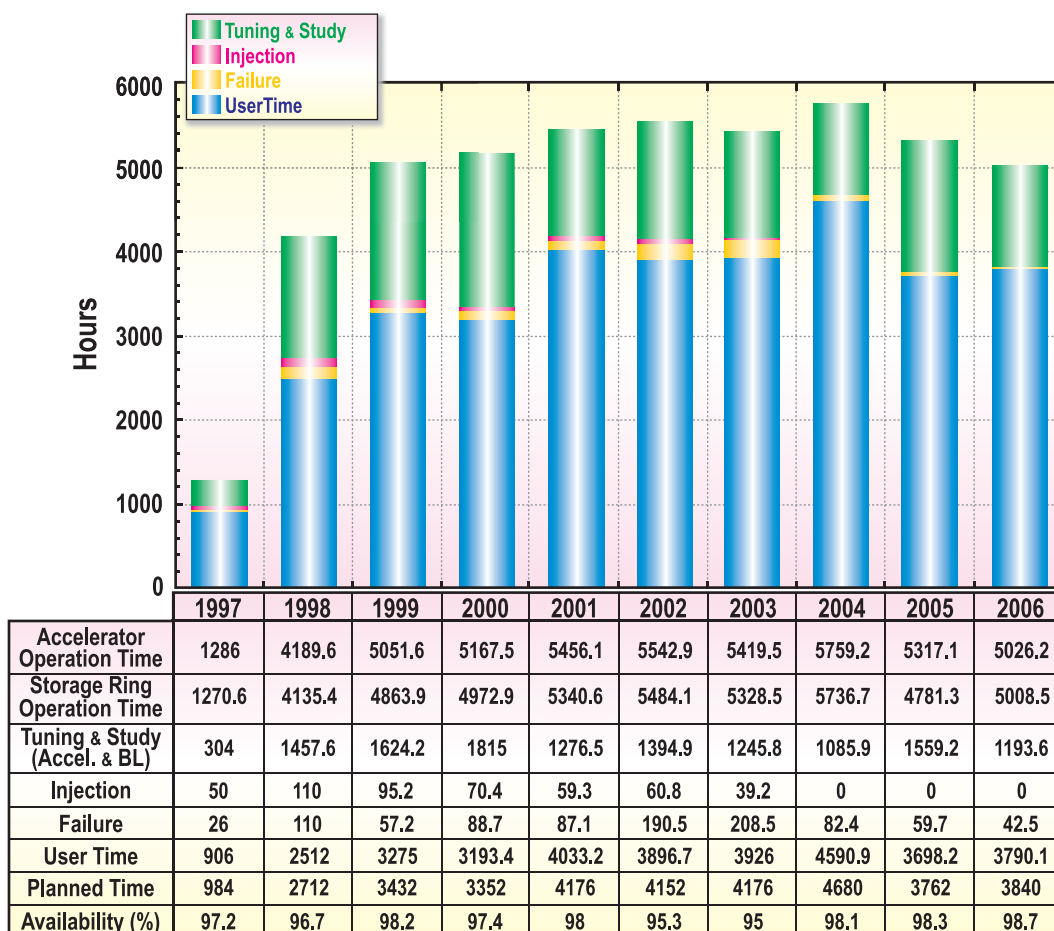


Fig. 1. Operation statistics since the facility became available to users.