

Machine Operation

The operation statistics since the facility was opened to users are shown in Fig. 2. In 2007, the total operation time of the accelerator complex was 5027.9 hours. The operation time of the storage ring was 5019.2 hours, of which 77.7% (3900 hours) was made available to the users. The downtime resulting from failure accounted for 0.7% (27.6 hours) of the operation time of the storage ring; in 2007, no considerable loss of user time exceeding several hours occurred. Since 2004, there has been no injection time because top-up injection was introduced. Concerning user service operation, the high availability (ratio of net user time to planned user time) achieved, e.g., 99.1% in 2007. The total tuning and study time of 1100.3 hours was used for machine tuning, and the study of the linac, booster synchrotron and storage ring, and also for the beamline tuning

and study.

Operations in three different filling modes were provided for the following user time: percentages 17% in the multi-bunch mode, 51.9% in the several bunch mode, such as the 203-bunch mode (203 equally spaced bunches) and 31.1% in the hybrid filling mode such as a 1/7- partially filled multi-bunch with 5-isolated bunches. In 2007, several bunch mode was the dominant filling mode. In particular, the 203-bunch mode reached 31.7% of the total user time. For the hybrid filling mode, 1.0 mA, 1.4 mA, 1.6 mA, or 3.0 mA is stored in each isolated bunch. An isolated bunch purity better than 10^{-10} is routinely maintained in the top-up operation. Table I shows a summary of the beam filling patterns.

Table II shows a summary of the useful beam parameters of the storage ring.

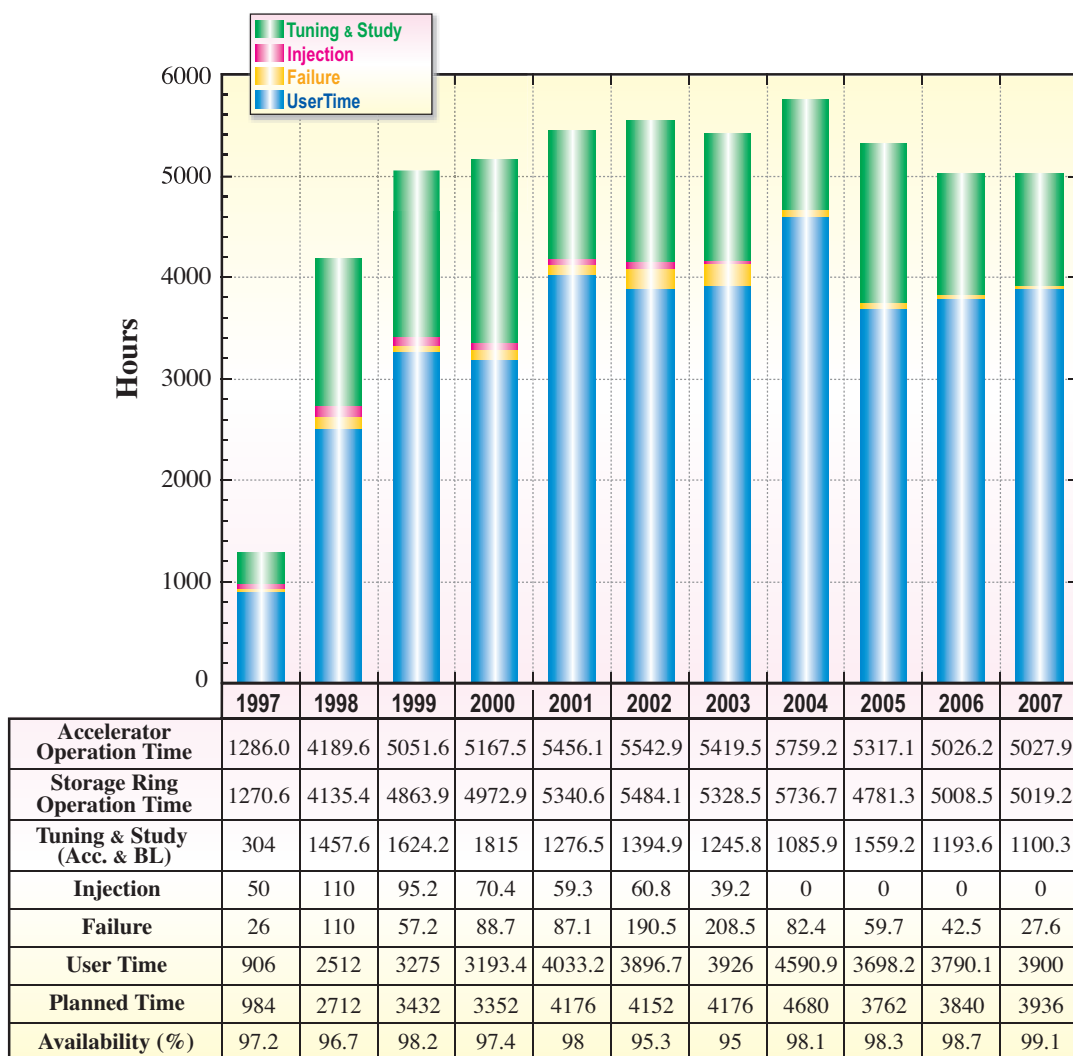


Fig. 2. Operation statistics since the facility became available to users.