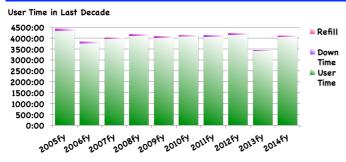# Status of Operation Reliability at the SPring-8 Storage Ring

M. Takao JASRI/SPring-8
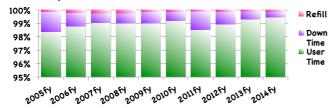
Introduction

In light source storage rings the beam availability is used as a measure of operation reliability, which is primarily regulated by the beam current. However, there are other barometers for availability, which measure the beam performance promised to the users. For example, the beam profile, or the emittance coupling, is the important parameter for the brilliant light source facilities. The bunch impurity and the current irregularity relating to the bunch filling mode are other essential parameters for time resolved experiments. Here we report the metrics and the status for the operation reliability of the SPring-8 storage ring.
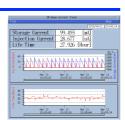
Operation Statistics

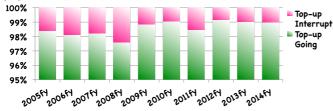### User Time in Last Decade

Beam Availability in Last Decade

Status of Top-up Operation

To keep the stored current constant, the beam is frequently injected during user time.

Stored Beam Stability: 0.03%
  Target Stored Current 99.5mA
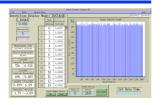 Injection Current   30µA
  Shot # per Injection   1

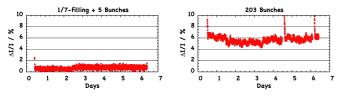### Top-up Availability (Time with Stored Current > 99.4mA / User Time)

Status of Bunch Filling Mode

	Bunch Mode	Single Bunch Current
M	Multi-bunch Mode	
A	203 Bunches	0.5 mA
B	4-bunch Train X 84	0.3 mA
C	11-bunch Tran X 29	0.3 mA
D	1/7-filling + 5 Bunches	3 mA
E	2/29-filling + 26 Bunches	1.4 mA
F	1/14-filling + 12 Bunches	1.6 mA
G	4/58-filling + 53 bunches	1 mA
H	11/29-filling + Single bunch	5 mA

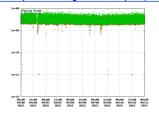**User Request for Irregularity of Single Bunch Current: < 10 %**

1/7-filling + 5 Bunches

203 Bunches

Bunch Purity

Impurity: Ratio of Satellite Bunch to Main Bunch

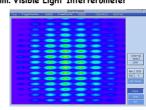**User Request for Single Bunch Impurity: < 10^{-8}**

Beam Profile

For light source storage rings, beam profile parameters, especially vertical beam size and beam tilt, are essential.
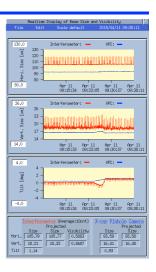Vertical beam size easily changes due to the error field of insertion devices.

X-ray Pin Hole Camera

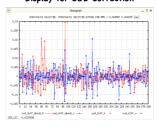### 2-dim. Visible Light Interferometer

Stored Beam Orbit

Orbit stability is crucial for synchrotron radiation facilities.
To keep orbit constant, slow feedback with 1 Hz is running during user operation.
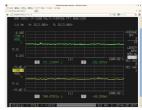
Auto COD Correction Control GUI

Display for COD Correction

Fast Beam Position Monitor

Trend Graph of COD Drift