

# Brief Summary of IWBS2002

Hitoshi, TANAKA @ SPring-8

## (1) Facility Report

**Existing Sources: ESRF, APS, SPring-8, PAL, Elletra, SLS, ALS, Bessy II, SSRL, NSLS reported the activities on orbit stabilization focusing original works.**

**A few ~ 5 um stability almost achieved in major Lab. Some of them reaches the sub-micron level.**

\* **Y. C. Chao (Jefferson)**: special topic relating to the analysis tool to optimize the system which is applicable to COD correction one.

\* **Z. Dai (SSRF)**: Design works from the viewpoint of orbit stabilization.

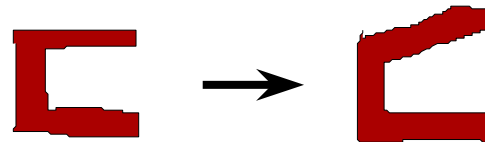
\* **R. Ursic (Instrum. Tech)**: Overview of DBPM system.

## **(2) Capability of Source Suppression**

**Rich knowledge is being stored in each Lab.**

**By reducing the sources, level of 1  $\mu\text{m}$  is reachable in the frequency range from a few Hz to a few 100 Hz.**

**\*Cooling Water:**



**\*Thermal Equilibrium: Long L drift after the shutdown observed in many Labs.**

**\*Multipole Current Ripple:**

**\*Vibration of Girder & MAG.: Girder Damping Structure by L. Farvacque(ESRF)**

**\*Vibration of Vacuum Chamber: Mechanism and correction example shown by S. Matsui & M. Oishi(SPring-8)**

**\*ID Feedforward Table: Perfect work shown by D. bulfone (Elletra)**

**\*Building Structure & Basement**

**\*Mechanical Interference:**

**\*Precision of BPM: One idea to suppress the position shift with "invar support"**

**by J. Safranek(SSRL).**

**POMS for monitoring mechanical shift of BPMs reported by M. Boge & T. Schilcher(SLS).**

**\*High Accuracy of Using Model**

**\*Non full energy injection: Commented by E. Karantzoulis(Elettra) and by ???(PLS).**

**\*Many things...**

### **(3) Slow Orbit Measurement & Correction**

**Each Lab. has own system. Methods and approaches have many varieties. All looks highly completed and working well.**

#### **Hard or Soft corrections?**

**Ideally Hard should be done. however, to do this we need the almost perfect information of orbit and photon beam axes.**

**Regarding to the consideration of direct information of X-ray axis, L. Emery and O. Singh (APS) showed the APS's trial.**

**How to get the healthy eigen vectors?**

**Optimized BPM and STR arrangement is the key.**

**One example is a SLS case shown by M. Boge.**

**Single or Double correction systems, which is better?**

**Ring condition strongly affects on this decision.**

**However, if we could design new machine, a single system is better(??).**



#### **(4) Fast Orbit Measurement & Correction**

**DBPM system seems to be promising to realize a sub-micron precision. However, we never stop to develop or improve this kind of system to go further.**

**NSLS trial shown by B. Podobedov(BNL) is impressive for me. Under small man power and limited condition, They constructed a pretty good system.**

## **(5) Towards sub-micron orbit stability**

- \*Electric circuit upgrade**
- \*BPM mechanical shift monitoring & control**
- \*X-ray optics stabilization**
- \*ID shimming and its perfect transparency**
- \*Stable building basement**
- \*XBPM precision and stability improvement**
- \*Road surface improvement**

**Necessity of absolute reference in both the inside and outside of machine tunnel was discussed.**

**(6) Extremely important thing**

**\*Collaboration with user**

**\*The fact that users never satisfy with  
present stability**

**Best commentators selected by H. Tanaka:**

**L. Emery,**

**E. Karantzoulis,**

**C. Steier,**

**M. Boge,**

**L. Farvacque,**

**R. M. Muller**

**S. J. Park**

