Updates of the EC experiment at KEKB 1

Comparison of the electron cloud density in Al duct and Cu duct

11 November 2009K. Kanazawa, KEKB vacuum group

Conditions

- Location: ~100m downstream from the soft bend for the SR monitor (The major electron source is scattered photon.)
- Duct size: ID94, 1350mm long

| Cu duct | Al duct |
|-------------------------------------|------------------------------|
| Extrusion | Extrusion |
| JIS C1011 (AMS C10100) | JIS A5052 |
| Chemical etching $(H_2SO_4+H_2O_2)$ | Chemical etching (H_3PO_4) |

Comparison (linear scale)



Comparison (log scale)



Updates of the EC experiment at KEKB 2

Groove structure in a wiggler magnet

11 November 2009Y. Suetsugu, KEKB vacuum group

Setup in KEKB e⁺ ring

- A test chamber was installed in a wiggler magnet.
 - For tests of a clearing electrode or a groove structure
- With a RFA, flange insertion
- Wiggler magnet:
 - Magnetic field: 0.78 T
 - Effective length: 346 mm
 - Aperture (height): 110 mm
 - The monitor and insertion are placed at the center of a pole.
- Irradiated photons: $2x10^{17}$ photons/s/m at 1600 mA



Setup in KEKB e⁺ ring

• A test chamber with an electron monitor (with RFA) and a clearing electrode or a groove structure.



Experiments

- So far, we had tested;
 - Flat TiN-coated surface
 - Groove
 - 20° triangle, 5 mm depth, R<0.1, with TiN coating, SS
 - 20° triangle, 2.5 mm depth, R~0.1, no TiN coating, SS (electro-discharge)
 - Electrode x 2
- From 14th, October;
 - Groove
 - 20° triangle, 2.5 mm depth, $R\sim0.1$, with TiN, Aluminum

Results



Updates of the EC experiment at KEKB 3

Clearing electrode for a wiggler section of SKEKB

11 November 2009Y. Suetsugu, KEKB vacuum group

Beam pipe for wiggler section

- We will use clearing electrodes for beam pipes at wiggler sections of SKEKB.
 - Straight beam pipe
 - Total length is ~180 m (/3016m), but a key section for EC.
- A test beam pipe with antechambers with two electrodes was manufactured.
 - The actual structure
 - The final beam test

Test beam pipe

- Electrode: ~900 mm length, 40 mm width, with basically the same structure to those developed so far.
- Beam pipe: Extruded copper
- Electrode was welded by EB.



Test beam pipe

- The beam pipe will be installed in KEKB LER next week
 - Check the effect of electrode (outside of magnet)
 - The beam pipe has an electron monitor with RFA
 - Check the heating of electrode, feed through, etc.

