Status of Asian test beam facilities

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LCTW workshop @ Orsay 2009

KEK : FTBL & ATF

J-PARC : K1.1 &K1.8

IHEP : BTF

Tohoku : LNS

Asian accelerators

- electron : synchrotron facilities
- neutron : J-PARK
- High Energy :KEK,IHEP Beijing,

LNS

IHEP Beijing

KEK FTBL

J-PARK

Asian accelerators

- electron : synchrotron facilities
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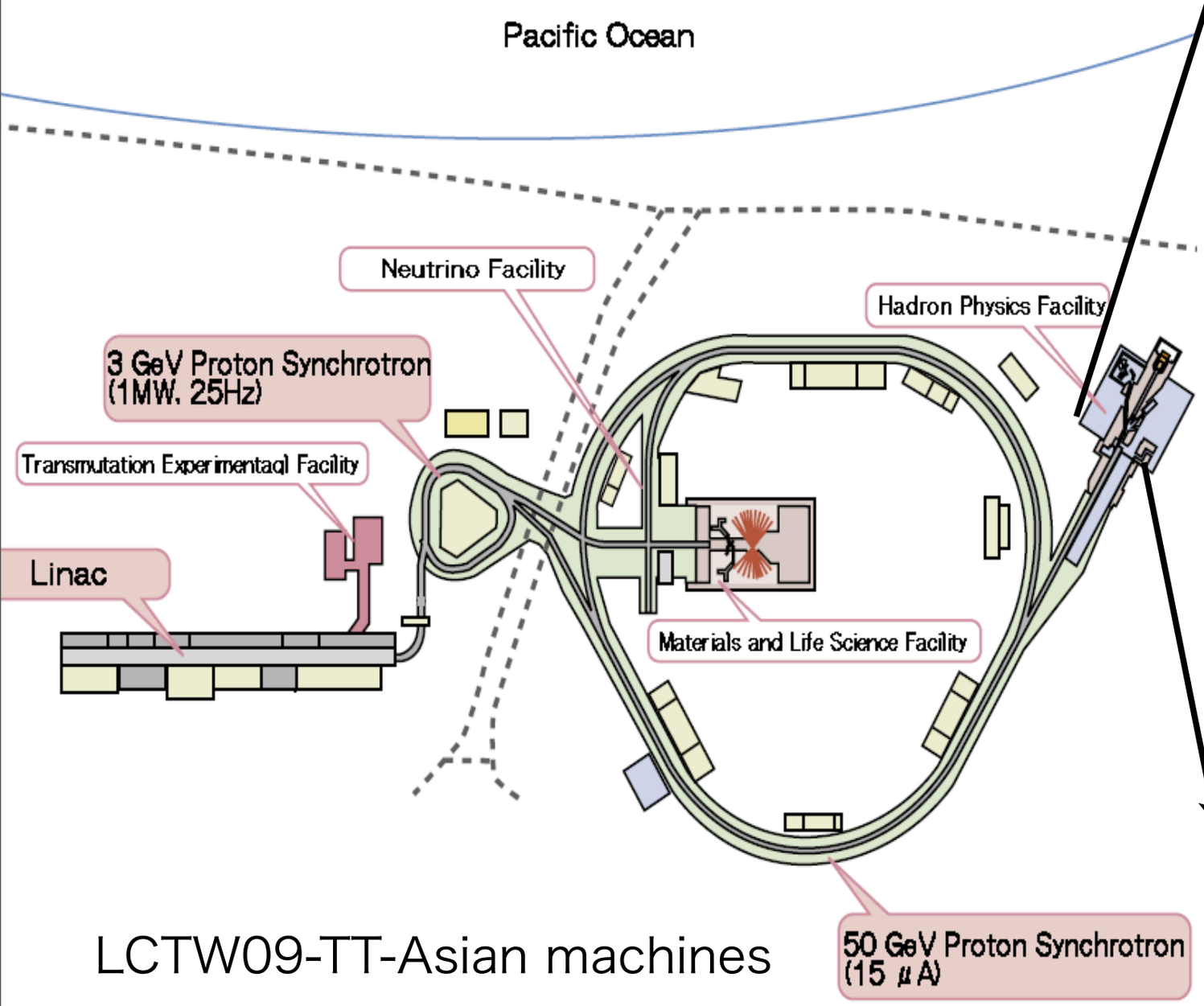
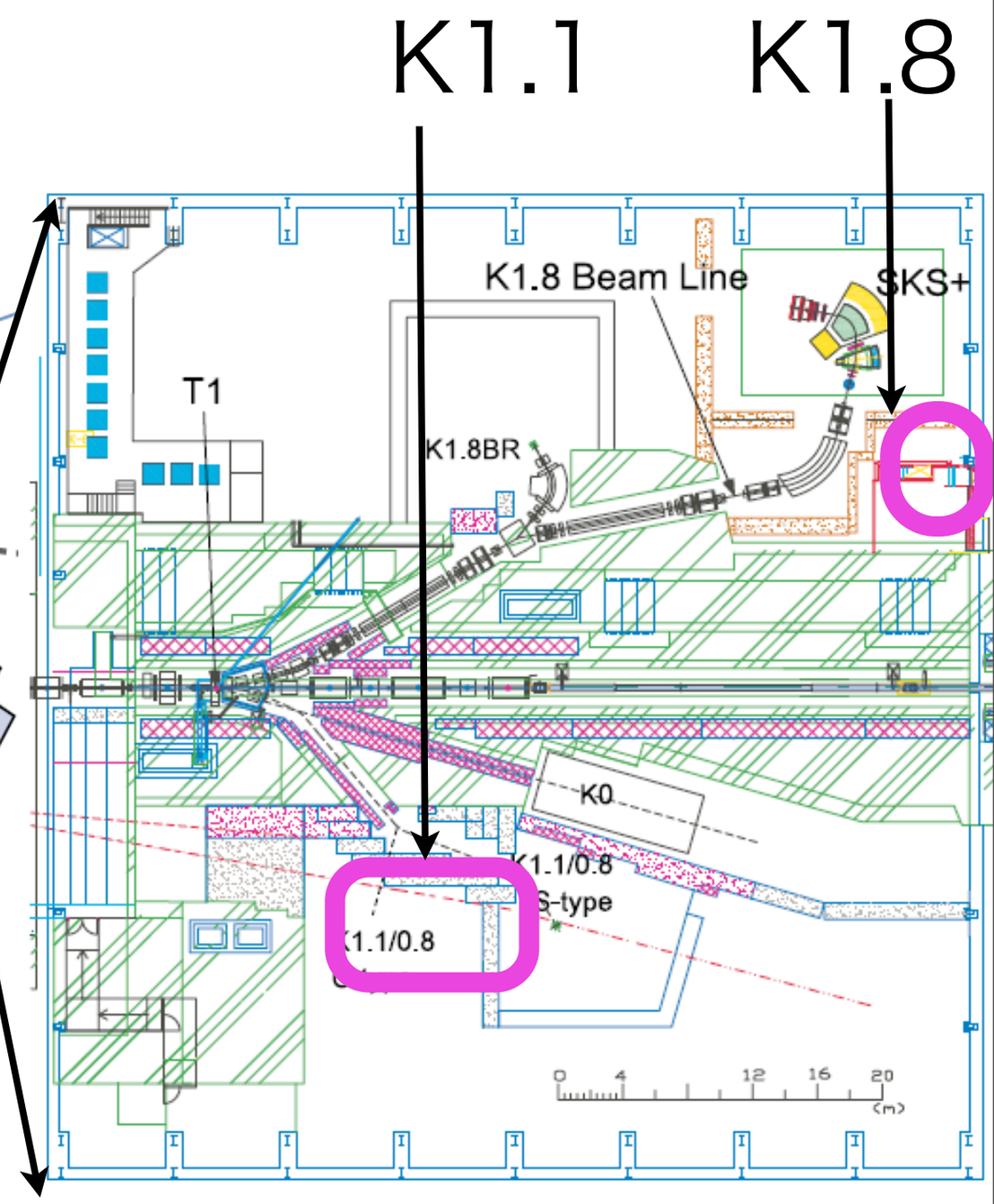
KEK : J-PARC

- K1.8 : expected as the test beam line
  - I_{ext} depends on machine I_{MRint}.
  - I_{MRint}=100kW good enough
  - current I_{MRint}=5kW small.
- K1.1 : tentative solution
  - in real exp. area

KEK : J-PARC

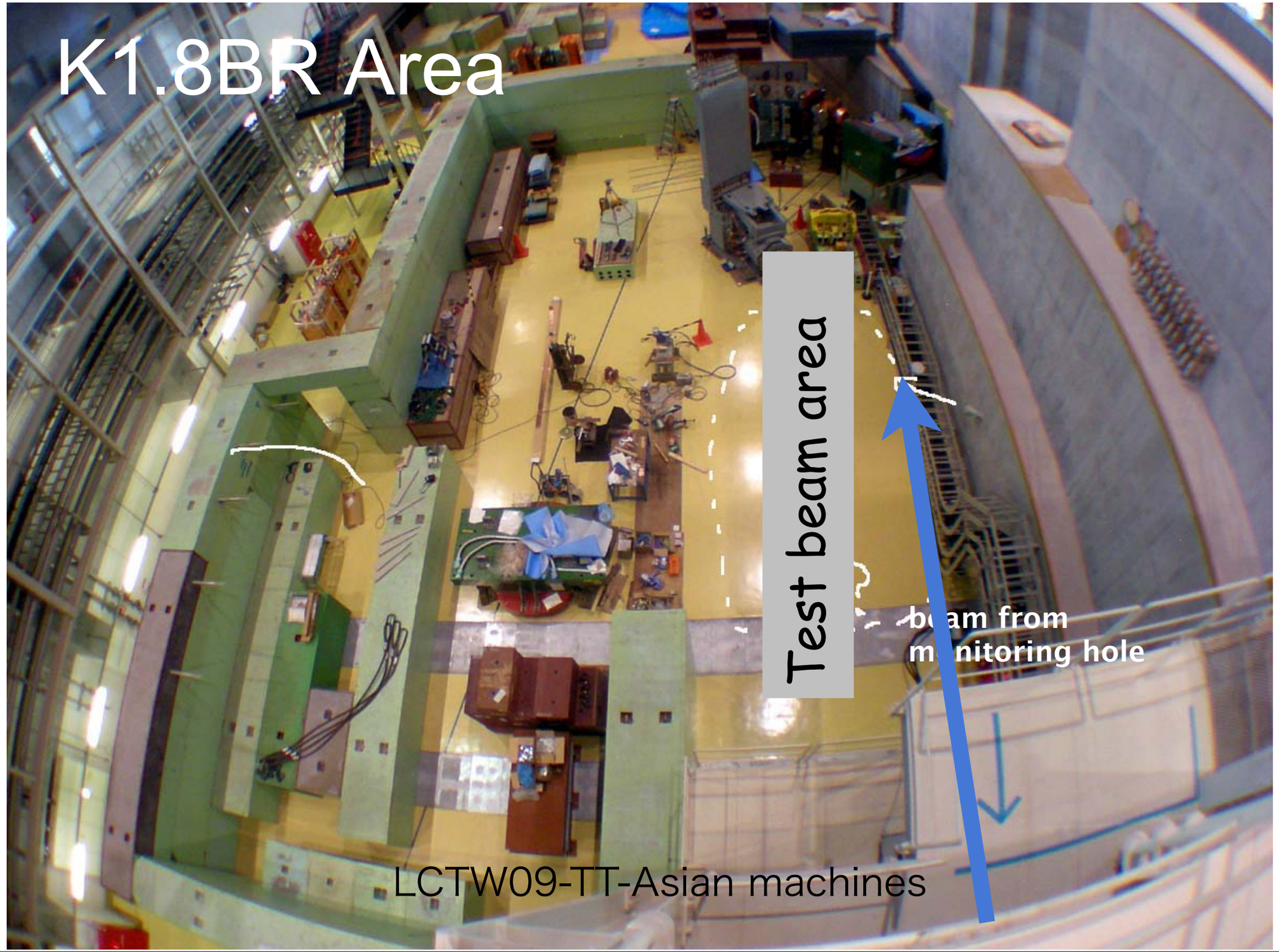
- accelerator complex
- 30GeV proton ring





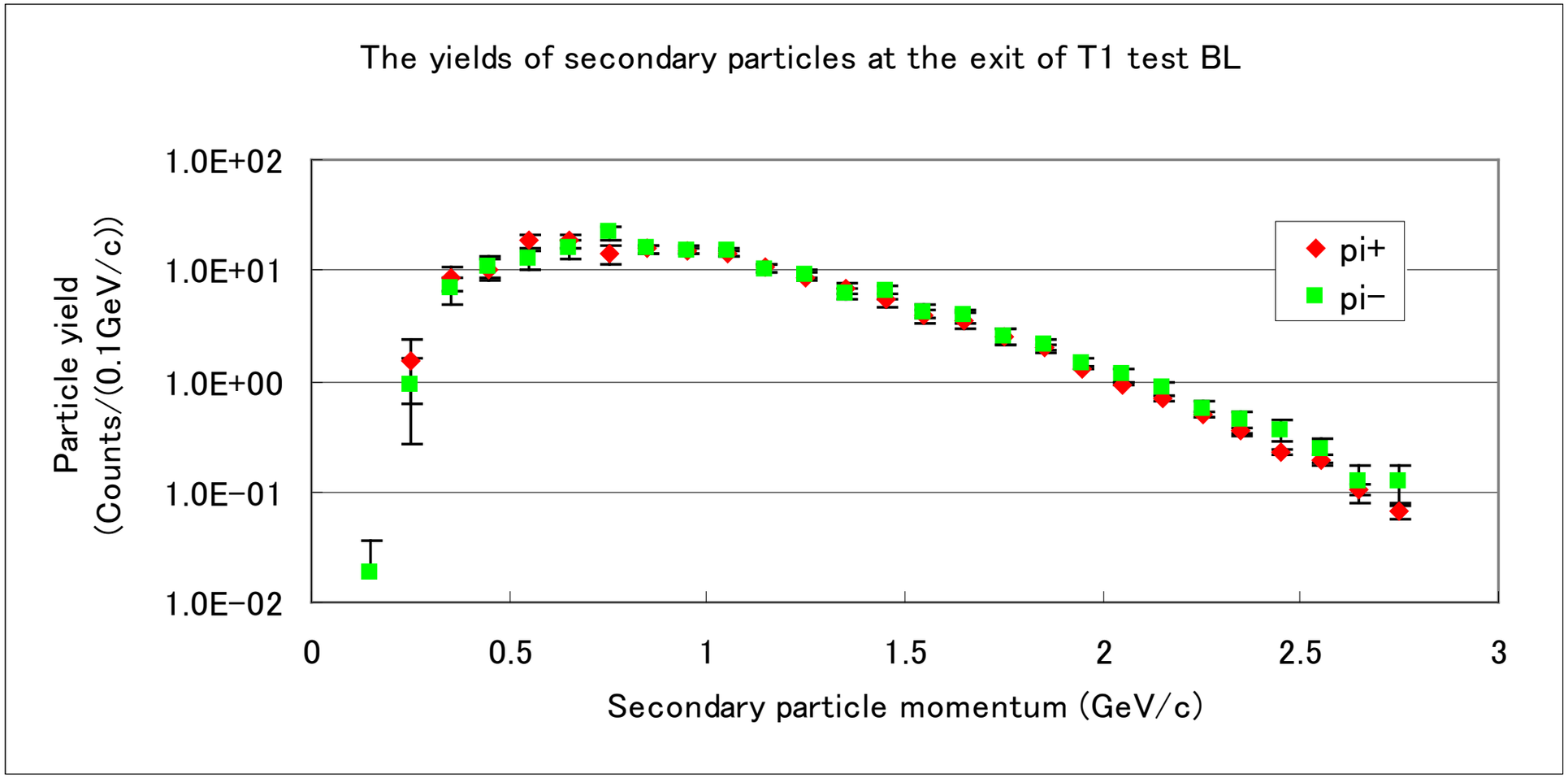
LCTW09-TT-Asian machines

- 0.5~1.5 GeV/c beam will be available.
- Beam Line (Hole) will be ready in the mid Japan Fiscal Y 2010.
- Yield will be reasonable at ~100kW (goal).
  but it has not been achieved yet(~5kW)



J-PARC K1.8 yield

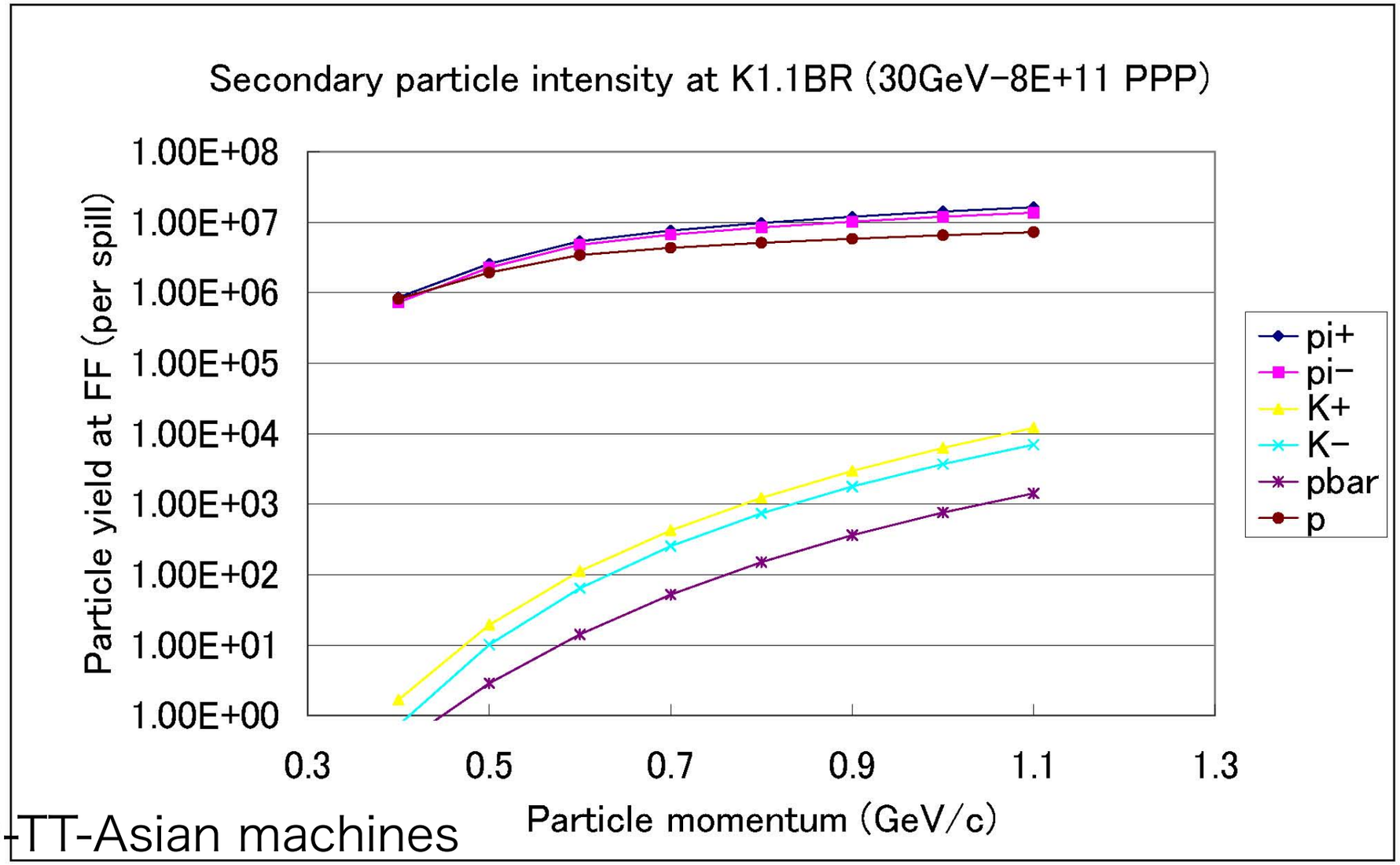
Yield calculation based on SW Formula



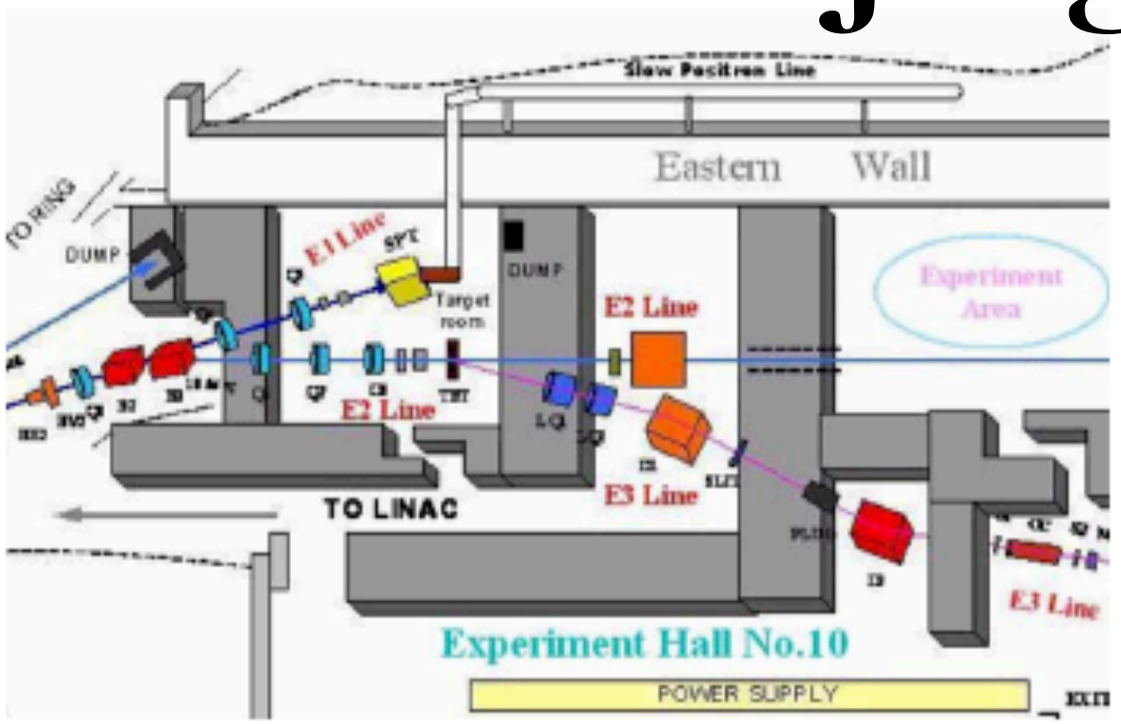
- Yield Calculation: Sanford-Wang Formula
  - Primary Beam Energy: 30GeV
  - Primary Beam Intensity: 8.0E+11 ppp (1.2kW)
  - Target: Beryllium (Ni: Yield ~ A)
  - Extraction Angle: 50°
  - Solid Angle: 0.043 msr
- Simulation Code: MARS15

J-PARC K1.1

- 0.5~1.1 GeV/c beam will be available.
- Yield will be more than enough even at ~1kW beam.
- Beam Line will be ready in the mid JFY2010.
- Beam Line construction Budget has already been approved by the Government.
- Operation as a Teat Beam will be terminated if the main Experiment beam is ready at K1.1BR.



IHEP- Beijing

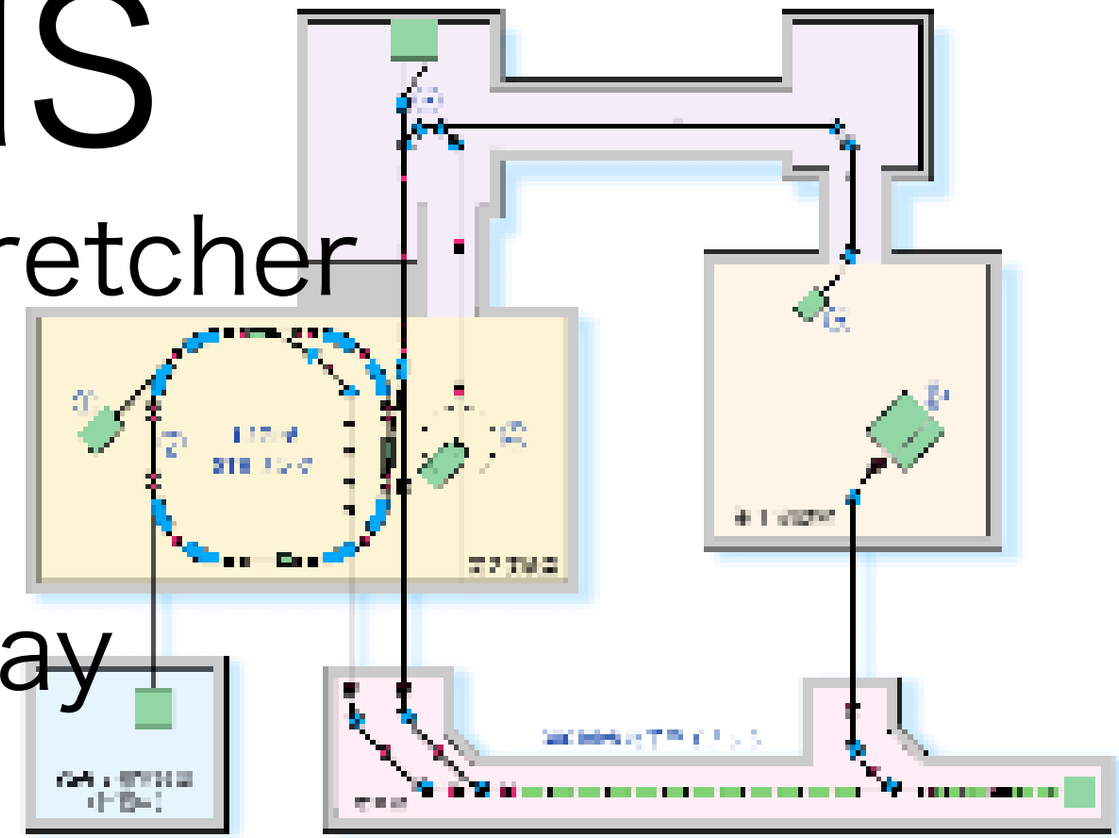


IHEP Beijing
(Li Jiacai)

- **Beijing Test Beam Facility (BTF) provides**
  - Primary electrons, 1.1-1.5GeV/c E1&E2)
  - Secondary e, π, p, 0.4 - 1.2 GeV/c (E3)
  - E3 area is equipped with Cherenkov, TOF, MWPC.
- **Last season (437hours) ended on 28th, March 2008.**
  - Test of low energy X-ray telescope for the HXMT project (all-sky Hard X-ray survey).
  - Test of MRPC (Multi-gap resistive plate chamber) for STAR experiment
  - Test of CVD diamond film detector to measure irradiate flux and dose rate for BEPCII & III.
- **Long shutdown 2008-2010 for upgrade**
  - Improve beam optics, beam monitors and alignment scheme
  - Equip "TPC+GEM" detector in the spectrometer for double particle ID and momentum resolution of 0.5%
  - Equip pulse dose measuring instruments in irradiation area.

Tohoku LNS

- 300MeV e + 1.2GeV stretcher
- >2MHz
- available almost everyday



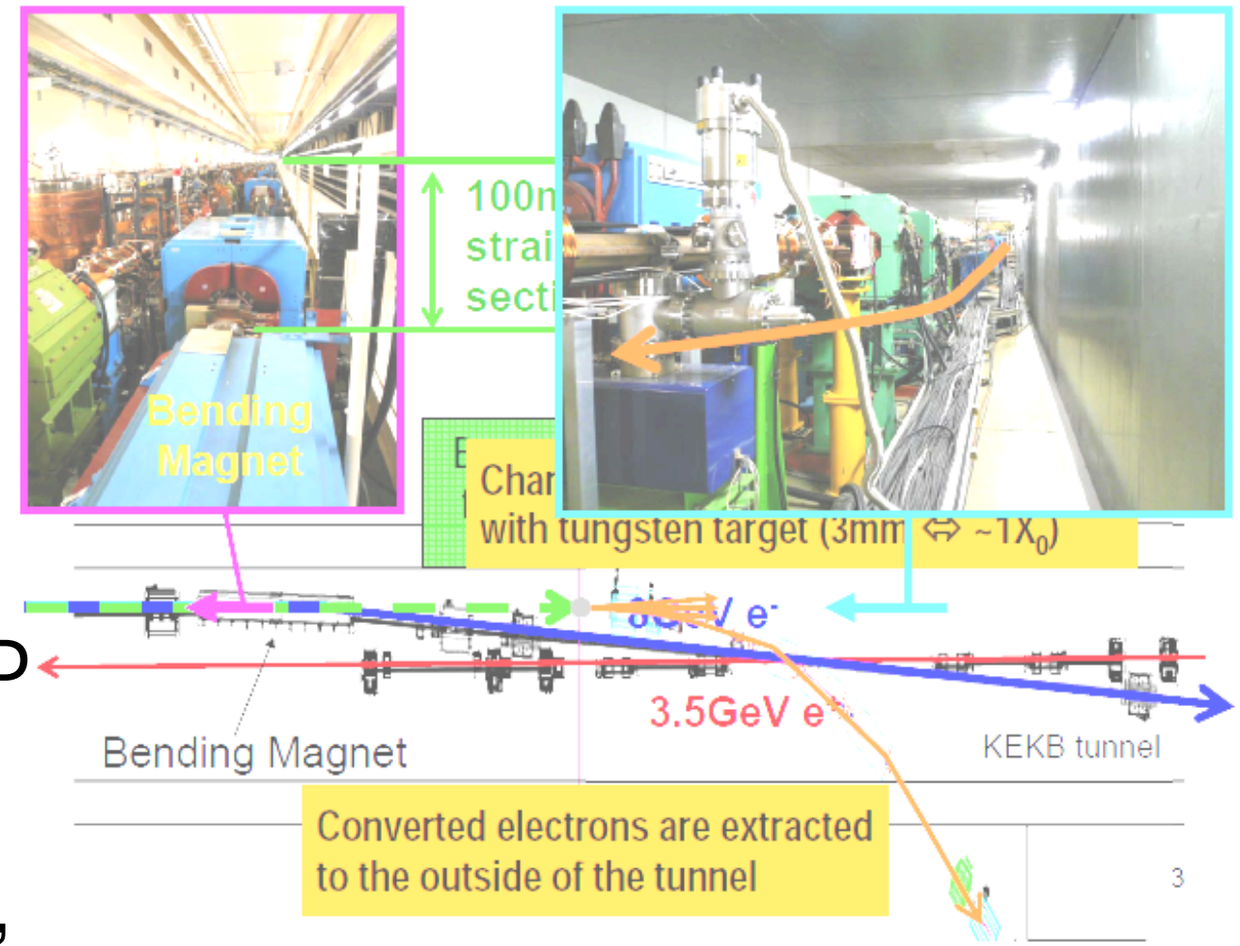
http://www.lns.tohoku.ac.jp/lns/beam.htm

KEK : FTBL

–**Electron with momentum 0.4~3.4 GeV/c**

–**Rate ~20Hz**

- Many test beam experiments have been performed:
  - –ILC: Scintillator study for ScECAL
  - –Belle: SVD, RICH, TOP detectors
  - –T2K , KASKA, ATLAS, Phenix, and so on

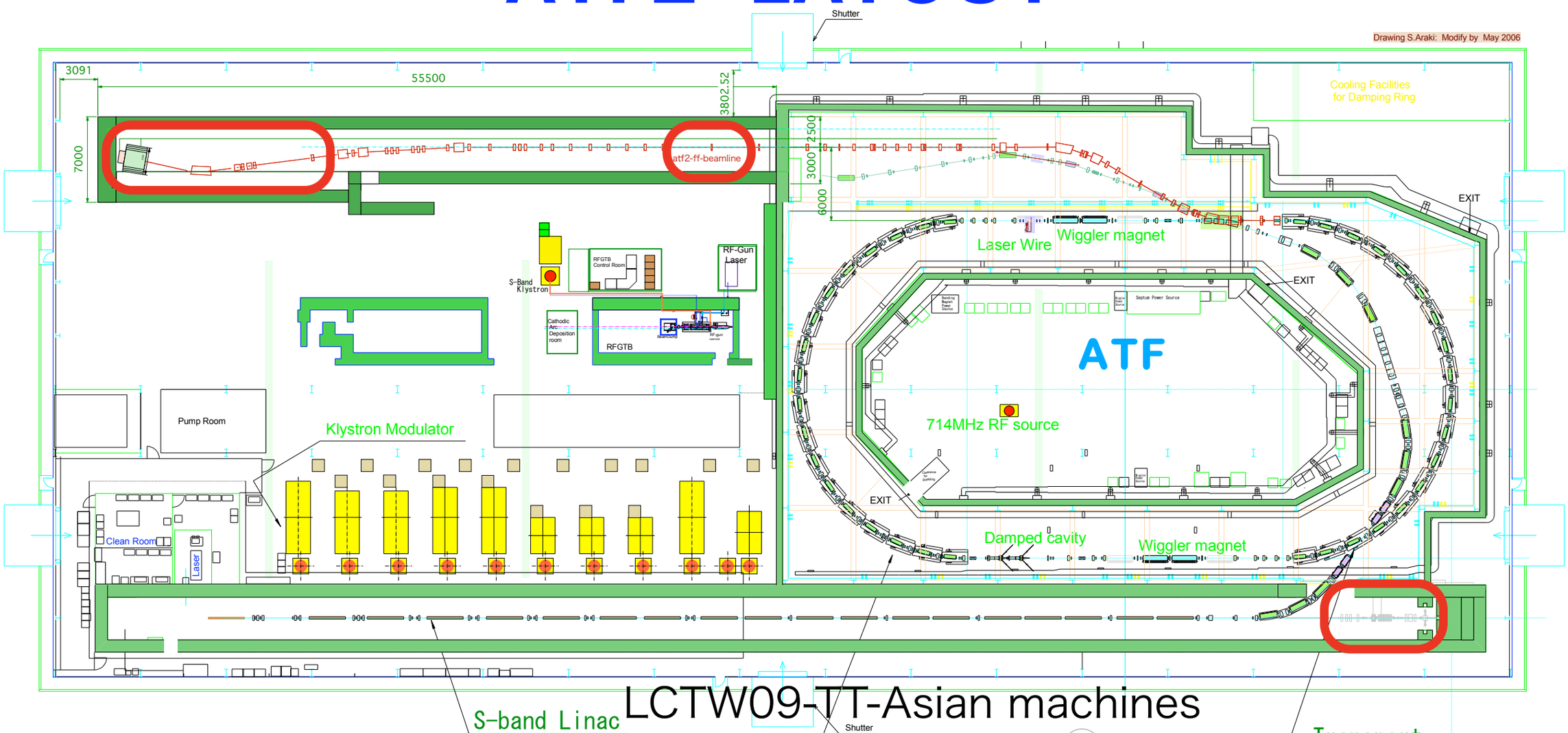


- shutdown for 2010-2012
- KEKB upgrade

KEK ATF

- electron < 1.4GeV
- in principle available 8h/2w * 10
- bunched beam in time 2.8ns
- N > 10^{10} /s (1.5Hz)

ATF2 LAYOUT



summary

Lab.	energy (GeV)	part. type	Rate (Hz)	Available time 2009 2010 2011 2012
KEK J-PARC	0.4-1.1	π,p	10^7	
IHEP Beijing	1.1-1.5 0.4-1.2	e π	25 1.5	
KEK ATF	0.4-1.4	e	10^{10}	
Tohoku LNS	0.3-1.2	e	10^6	
KEK FTBL	0.4-3.4	e	20	

There are many other electron machines for synchrotron facility such as SPRING8

LCTW09-TT-Asian machines