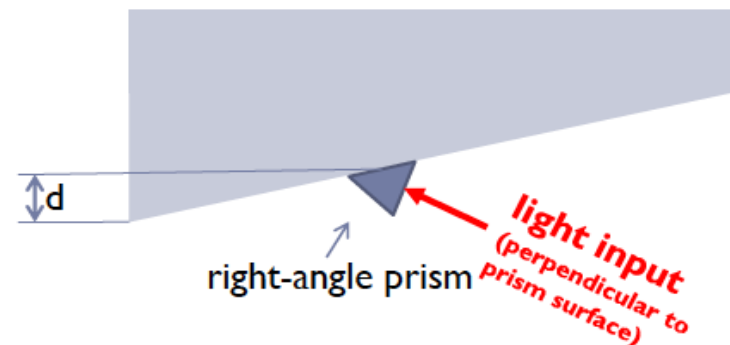


TOP: spazi per gli italiani

TOP

- Calibration system
 - Laser and fiber optics
 - Laser operation system
 - Online calibration
- Environment monitor
- Software work collaborating with Ljubljana
 - Conversion from raw data to reconstruction level
 - Applying calibration constant
 - Alignment scheme
 - Database handling
- Power supply
- Cooling system



ARICH

- mirror system (planar mirrors at the edge of acceptance)
- low voltage power supplies for read-out electronics
- quality assessment (cross check) of (a few) selected HAPD

Inoltre:

- nuovi MCPPMT: Atomic Layer Deposition (ALD)

EOM Workshop 20-21 Marzo

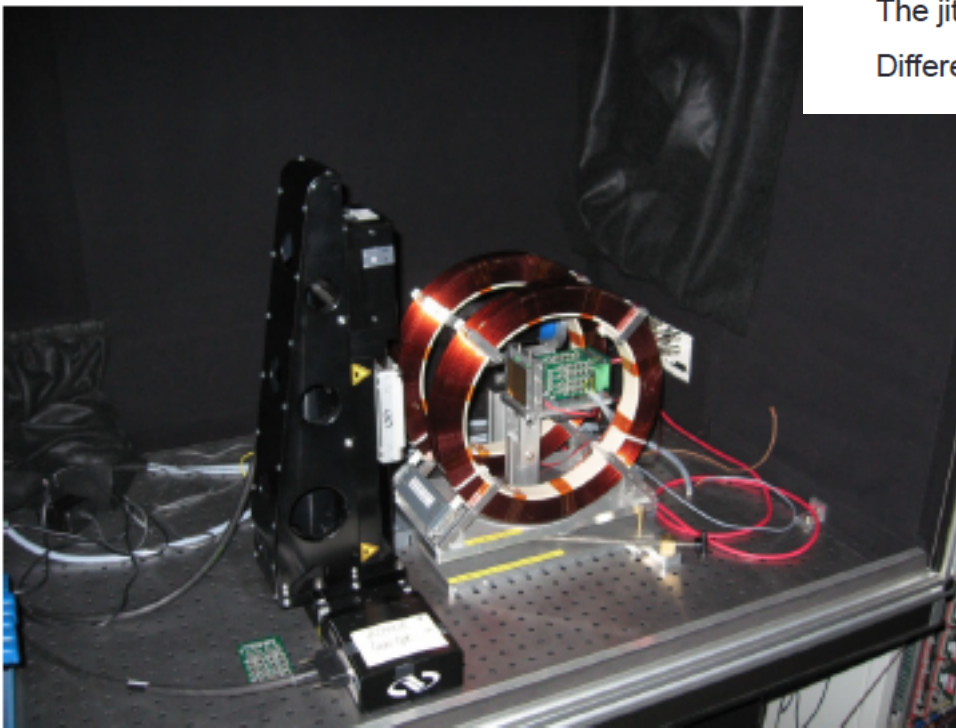
- nuovi MCPPMT: Atomic Layer Deposition (ALD)
- cookies vs optical grease per contatto ottico
- spazi per cablaggi segnali, HV, calibrazioni
- disegno della frontend box, del cooling, etc
- fiber calibration per l'allineamento temporale

Phone conferences (TO+BA+PD): 26/3, 11/4 (con Krizan)

- a PD e BA c'e' sia knowhow sia attrezzatura per collaborare al quality control dei PMT , se i nuovi possono uscire dal Giappone.
- trattative Nagoya-Hamamatsu per scambio PMT
- a KEK stano pensando a turni doppi x recuperare
- Peter Krizan vede bene tests ausiliari in Italia
- Full readout chain in Italia : autunno?
- PD: 3 possibili entries ex CMS, Legnaro: 1T magnet
- opportunita' ARICH: specchi per recuperare luce sui bordi
- urgent need: skilled techs per assemblaggio barre (a KEK)

INFN Bari

Ottimo set up : si
puo rapidamente
contribuire a quality
control e tests di
timing calibration



Laser PiLas

1 MHz PiLas
(single shot to 1 MHz)

PiL---	wavelength (nm)	tolerance (nm)	spectral width (nm)	pulse width (ps) ⁽²⁾	peak power in collimated beam (mW) ⁽¹⁾
PiL037SPS	375	± 10	< 7	< 50	> 400
PiL040	405	± 10	< 7	< 45 (< 25 ⁽²⁾)	> 400 (> 1 W ⁽¹⁾)
PiL043	440	± 10	< 7	< 60	> 200
PiL047	473	± 10	< 7	< 60	> 200



Very good for timing studies

EIG1000D with PiL063SM (fiber option)

The jitter between electrical trigger and optical pulse is about 3 ps - 4 ps.
Different kind of fiber collimator and mechanical light attenuator

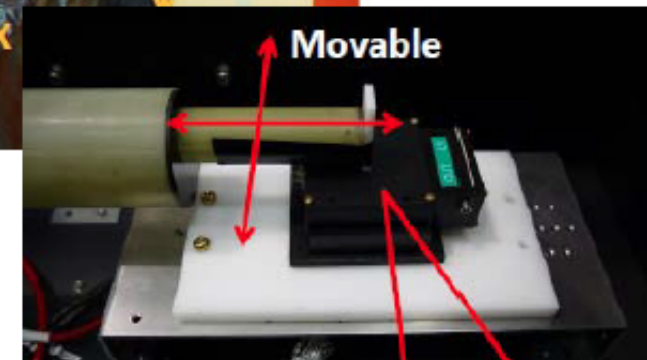
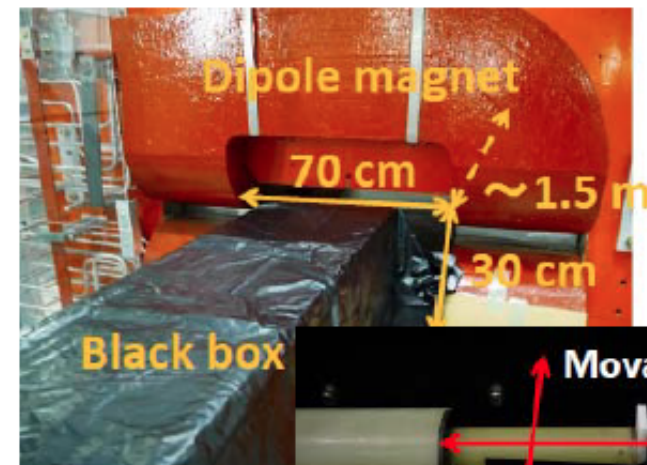
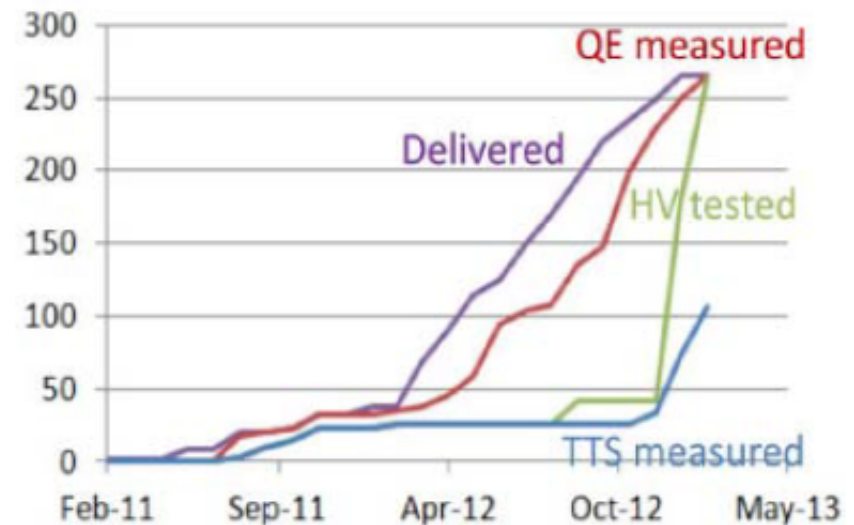
Positioning

3 linear stage with 1μm positioning accuracy



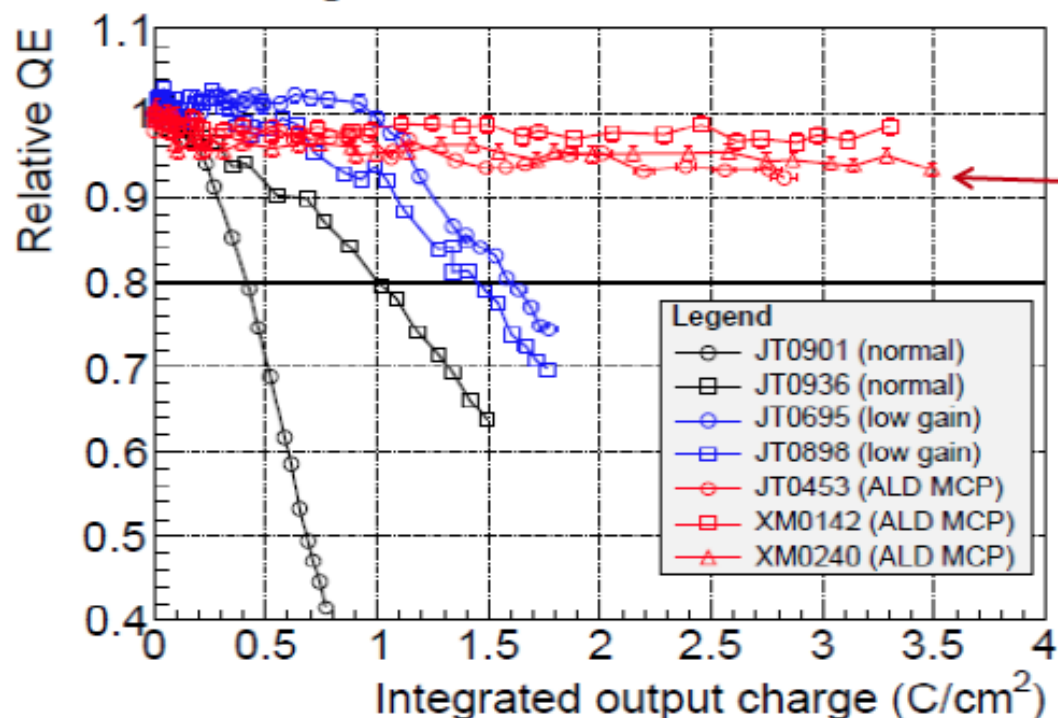
TOP: MCPPMT characterization

- Production is stable.
 - ~20PMTs/month
 - 265 PMTs delivered
- Acceptance test at Nagoya
 - QE measurement; OK, all passed
 - 3 PMTs/day
 - HV test; OK, 2 bad PMTs found
 - 8 PMTs/day
 - TTS and Gain; OK, but delayed
 - 107 checked/passed
 - 4 PMTs/day, We can catch up.
- Test in magnetic field at KEK
 - Measurement system was built.
 - Will check all PMTs within 6 months



TOP: cambiare i MCP-PMT?

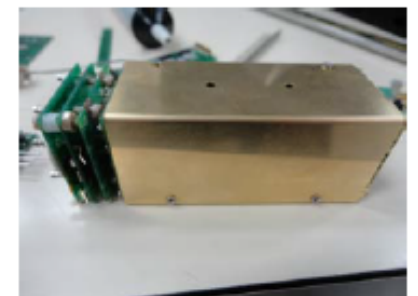
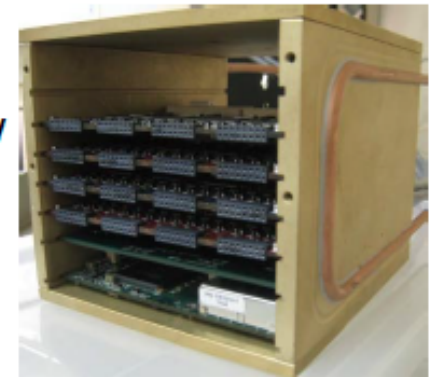
- Photocathode lifetime can be improved.
 - Will operate in lower gain (5×10^5) for normal PMT
 - ALD MCP-PMT prototype shows very long lifetime.
 - Keep 90% efficiency at least $>3 \text{ C/cm}^2$ (7.4 C/cm^2 for one PMT)
 - Will change to produce ALD MCP-PMT from next batch
 - Will get ~ 200 PMTs



7.4 C/cm^2 in total
(4.1 C/cm^2 at HPK)

Full scale test con 1/16 TOP a KEK

- CRT in March-April, beam test in May 9-18 at LEPS
- Almost final optical configuration
 - Using expansion block
- IRS3B ASIC readout
 - First priority: Need the performance test for DOE review
 - Fabrication in progress
 - Test with MCP-PMT and laser soon in March
 - Backup readout
 - CFD readout with 4ch merger
 - Test module production in parallel
 - For beam test, VME TDC used at previous beam test
- Evaluate the performance of full-size TOP counter



Partecipazione di U.Tamponi ai turni di test e all'analisi dati

Full scale test con 1/16 TOP a KEK

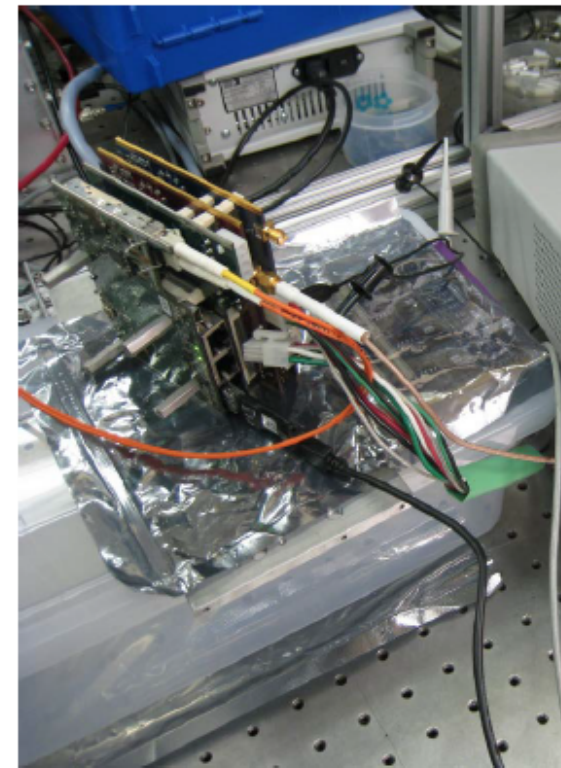
Many Integration Milestones

- Automated calibration and acquisition scripts
- Much progress in Region of Interest, FINESSE, COPPER CPU DAQ codes
- Collected data mirrored on kekcc, PNNL and Hawaii servers for prompt analysis
- Scripts to systematically scan injected signals through all channels, sampling windows very helpful to identify problems
- Resolving these found problems last major task

Full scale test con 1/16 TOP a KEK

Remaining Issues

- Version 3 firmware integration largely successful, however there remains sampling → storage timing alignment adjustments that are still needed
- Until sort out this issue, data quality is compromised: parallel testing at KEK, Hawaii
 - Focus in Fuji Hall on getting good single-photon laser data
 - In parallel, understand storage timing in Hawaii
- Time is very tight and many are working extremely hard



Full scale test con 1/16 TOP a KEK

Summary

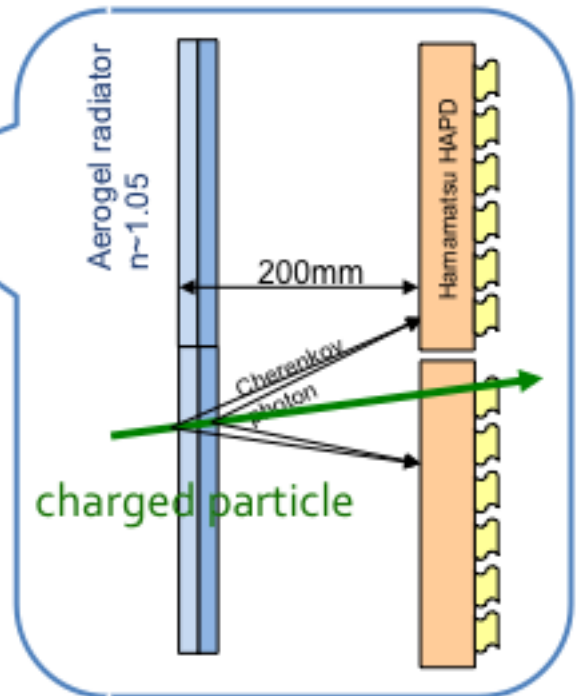
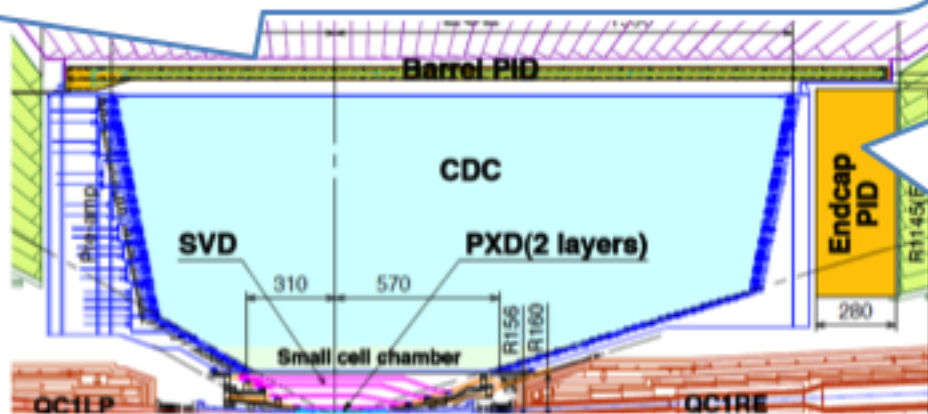
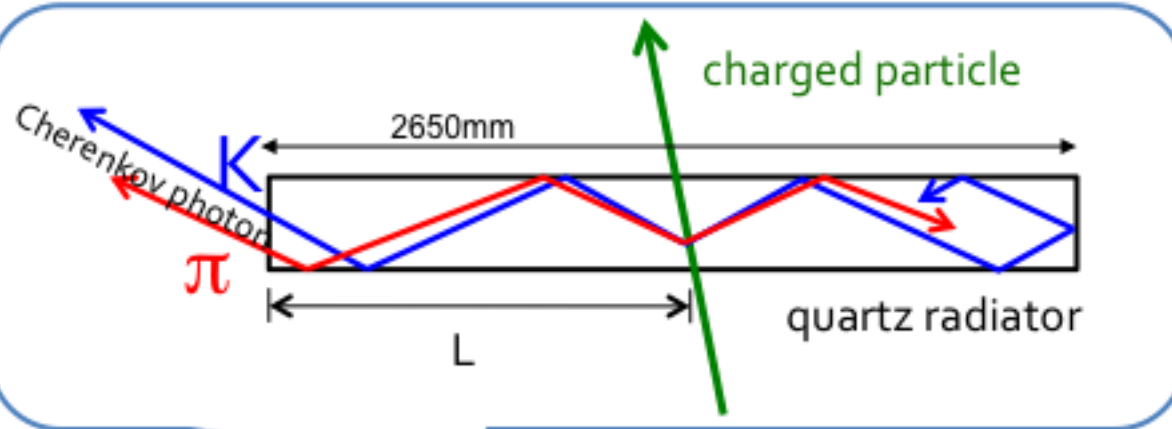
- Critical to resolve last of timing/configuration issues so that can start mass production of calibration constants/data logging
- Shipment date to LEPS is fixed @ May 2
- Must complete laser testing, start CRT test ASAP!
- Clear plan for final opto-electro-mechanics (summary report available soon)
- DOE Review schedule predicated on good May beam test data. Tools being developed now will speed that process, but much work yet to be done...

Belle-II: commitments

Group	Institutes
IR	KEK, Tohoku, Tokyo, ...
PXD	DEPFET collaboration, KEK, SOI group, ...
SVD	KEK, Vienna, Krakow, Tohoku, Tata, ...
CDC	KEK, Osaka-city, NPC, Taiwan, ...
B-PID	Nagoya, KEK, Hawaii, Cincinnati, Ljubljana
E-PID	KEK, Ljubljana, Tokyo metropolitan, Toho, Nagoya
ECL	BINP, KEK, Taiwan, Nara, Korea, Hanyang, Seoul, ...
KLM	ITEP, VPI, KEK, Osaka-city, Hawaii, Indiana, USTC(?), ...
TRG	KEK, Korea, Hanyang, ...
DAQ	KEK, IHEP, ...
STR	KEK
Soft/Comp	KEK, Karlsruhe, Melbourne, KISTI, Prague, Ljubljana, Krakow, MPI, IHEP, ...

Particle ID

Time of Propagation Counter (TOP) for Barrel



TOP challenge

Pattern recognition a 3
dimensioni: (x,y,t)
Con risoluzione
temporale ~ 50 ps

