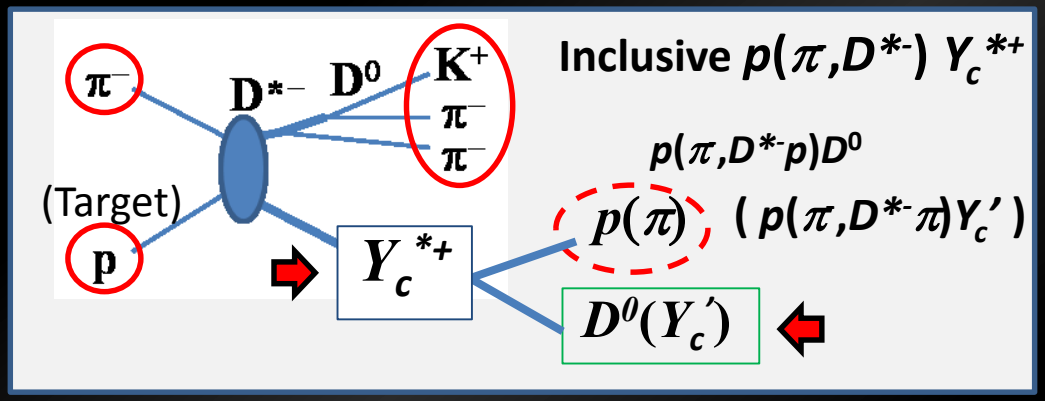
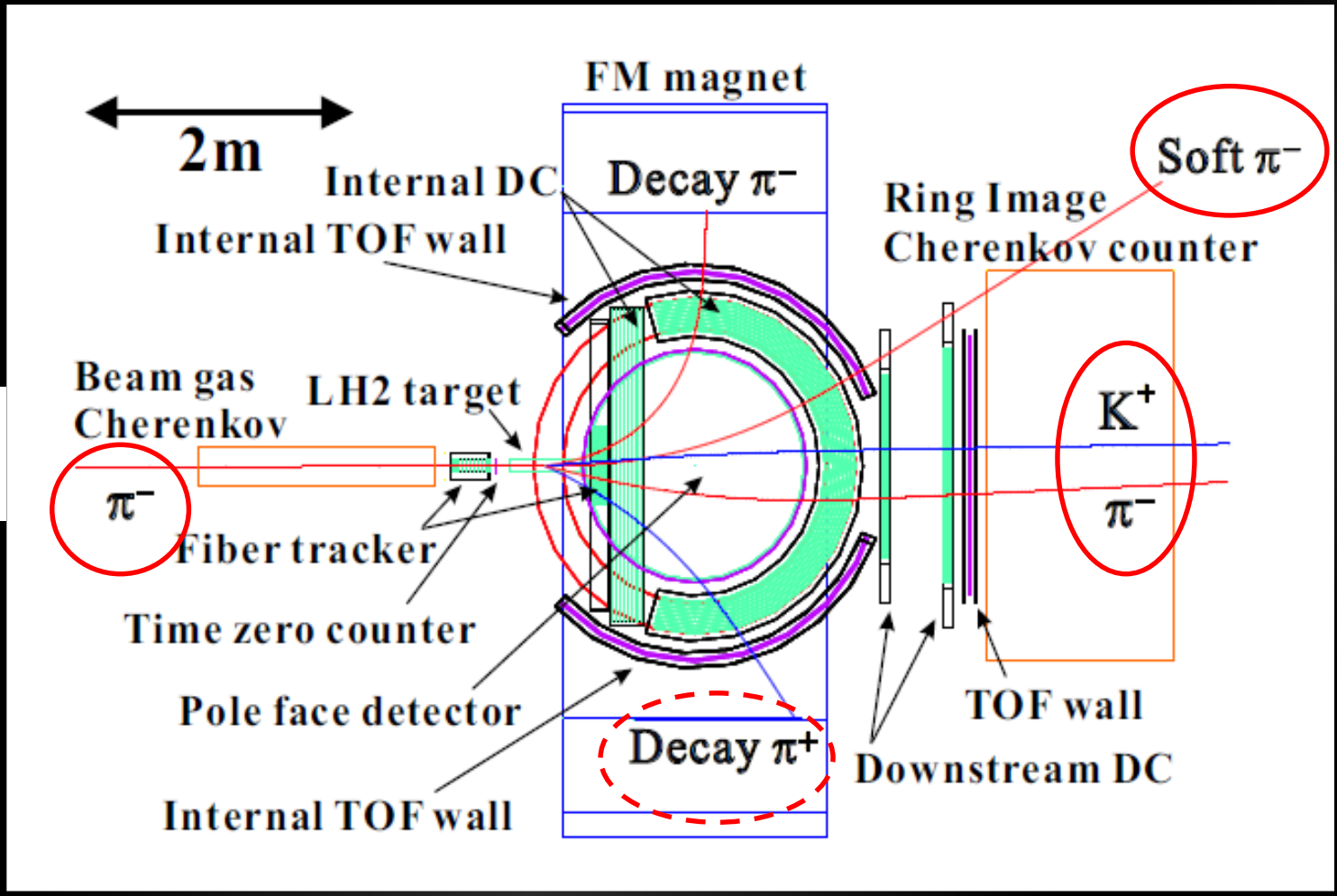
E50
Charmed Baryon Spectroscopy via the (π, D^{*-}) reactions

H. Noumi for E50, RCNP, Osaka University



Designed Spectrometer

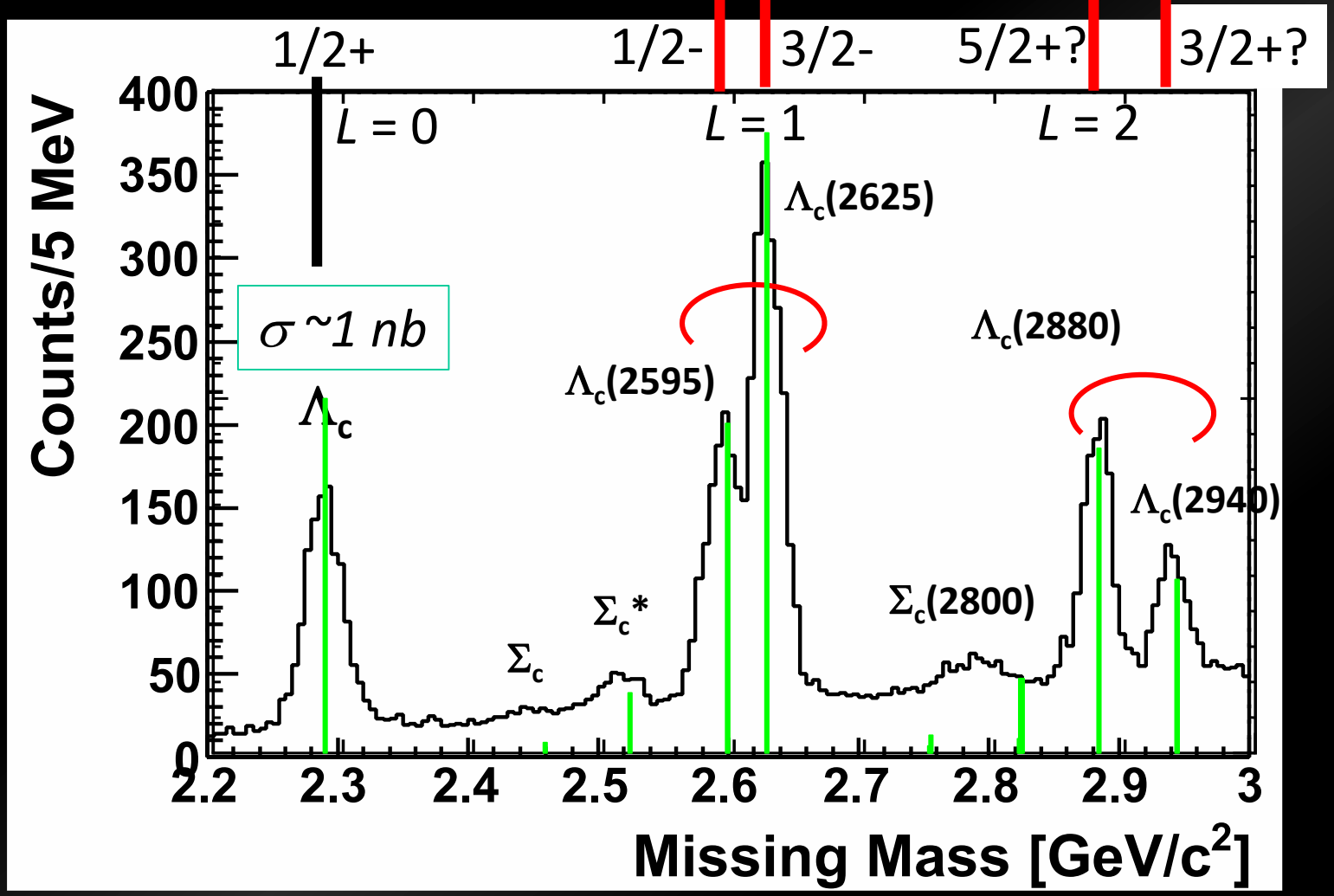
20 GeV/*c* Beam π^-



Large acceptance ~ 60% (for *D), ~85% (for decay π^+)**
Good resolution: $\Delta p/p$~0.2% at ~5 GeV/*c*

Missing Mass Spectrum (Sim.)

- ~1000 Y_c^*/nb/100 days
- Sensitivity: σ~0.1 nb for Y_c^* w/ Γ=100 MeV



The PAC noted

1. The PAC reiterates the recommendation of a closer interaction with lattice QCD theorists to understand the role of diquarks in charmed baryons. It is also desirable to discuss further with theorists in order to develop reliable predictions for the hadroproduction cross sections they plan to measure…
2. TheExtracting a small charm signal from the combinatorial background in hadroproduction requires a sophisticated detector and significant manpower for construction.

Collaborations w/ theorists

- Production: S.H. Kim, H.C. Kim, Hosaka, HN
  - Phys.Rev. D92, (2015)094021:
- Decay: Nagahiro, Yasui, Hosaka, HN
  - $Y_c^* \to \pi Y_c$: rho/lambda mode
- LQCD: Ishii, Murano, Sugiura, Watanabe, Hosaka, HN
  - Form Factor, Coupling Constant

High-p Collaboration

http://www.rcnp.osaka-u.ac.jp/indico/event/916/

- Cooperative works of activities at High-p BL
  - E50+E16+J-PARC-HI+Potential Users+Facility Group
- Detectors
  - High Speed Counters: RPC from LEPS and HI
- High Speed DAQ
  - From ALICE
- Enhances Physics Cases
  - Muon ID: J/ψ, dimuon
- Facility
  - Production TGT, BSO, Magnets, Radiation Safety, etc.

RPC at LEPSII

By N. Tomida (RCNP)

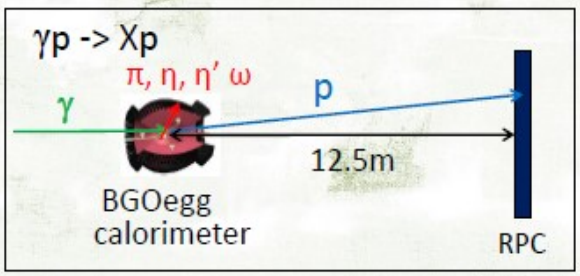
Application for E50

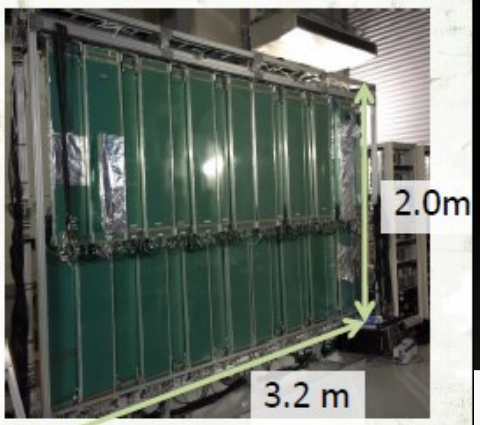
BGOegg TOF-RPC

- Developed in 2010-2014 • 2014- used for physics exp.
- 1st TOF-RPC using large readout strip in the physics experiment
- coverage area per TDC channel: 250cm²/channel

1 order larger than conventional RPCs

- 260μm x 10gaps
- Strip : 2.5cm x 100cm
- 32 chambers • Gas : R134a:butane:SF6 = 90:5:5
- at LEPS2 @ SPring-8
- Proton energy measurement
- TOF start : RF (σ~8ps)

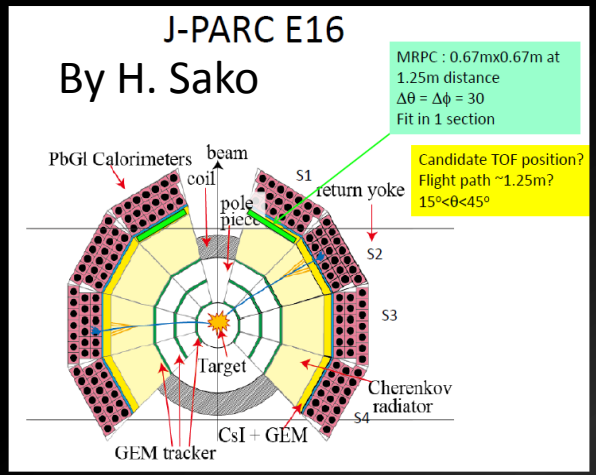




MRPC to be installed in E16

J-PARC E16

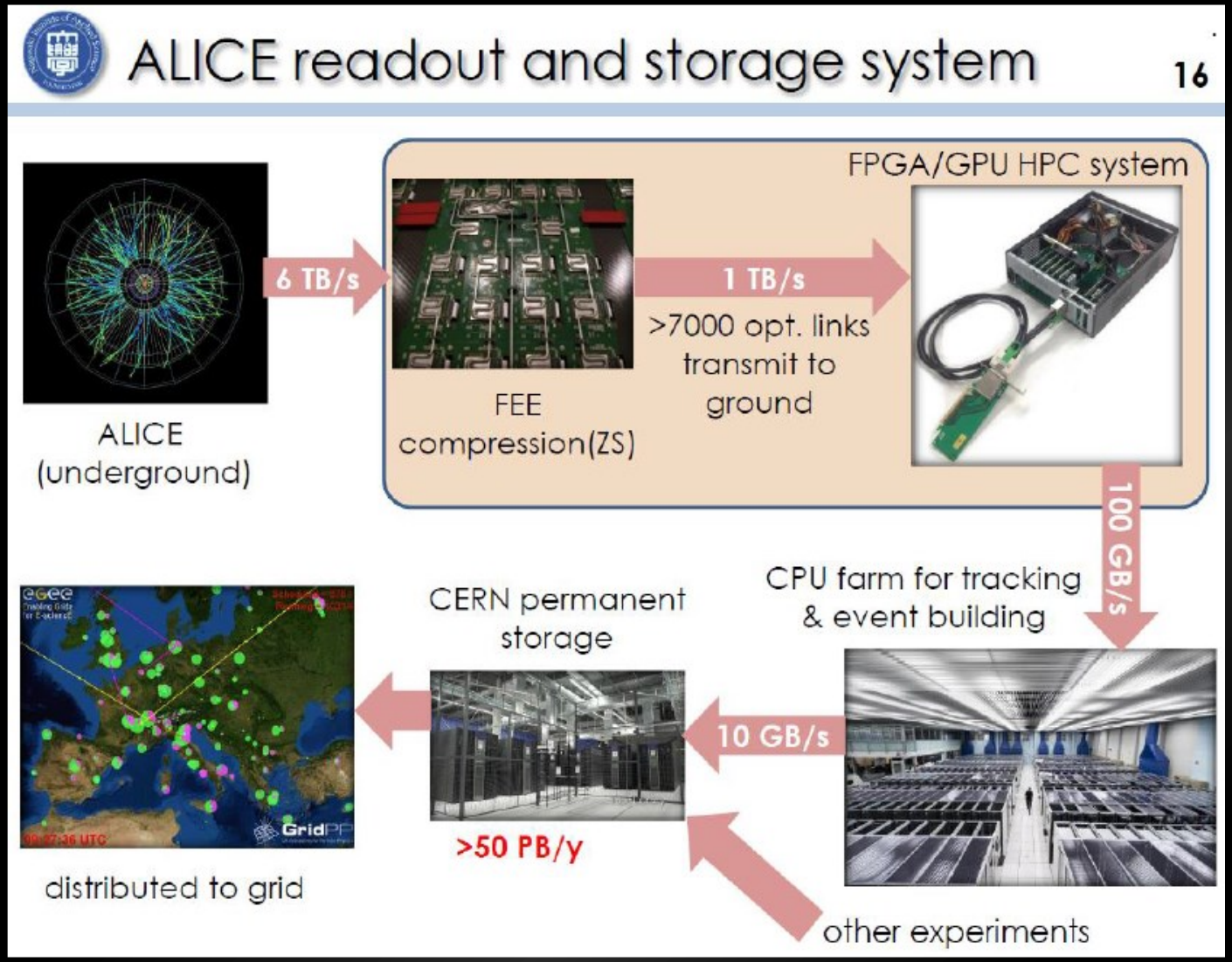
By H. Sako



For E50

	BGOegg RPC	E50
TOF resolution	~75ps	~110ps
START	8ps	100ps -> 85ps ?
RPC+FEE+TDC	~75ps	50ps -> 70ps ?
Strip size	2.5 cm x 100 cm	880 ch (11m²)
Signal summation	yes	440 ch (11m²)
Chamber size	20cm (W) x 100cm (L)	200 cm (L) if possible
Rate capability	At least 1kHz/cm² locally	> 1kHz/cm² locally

ALICE upgrade



50 GB/spill

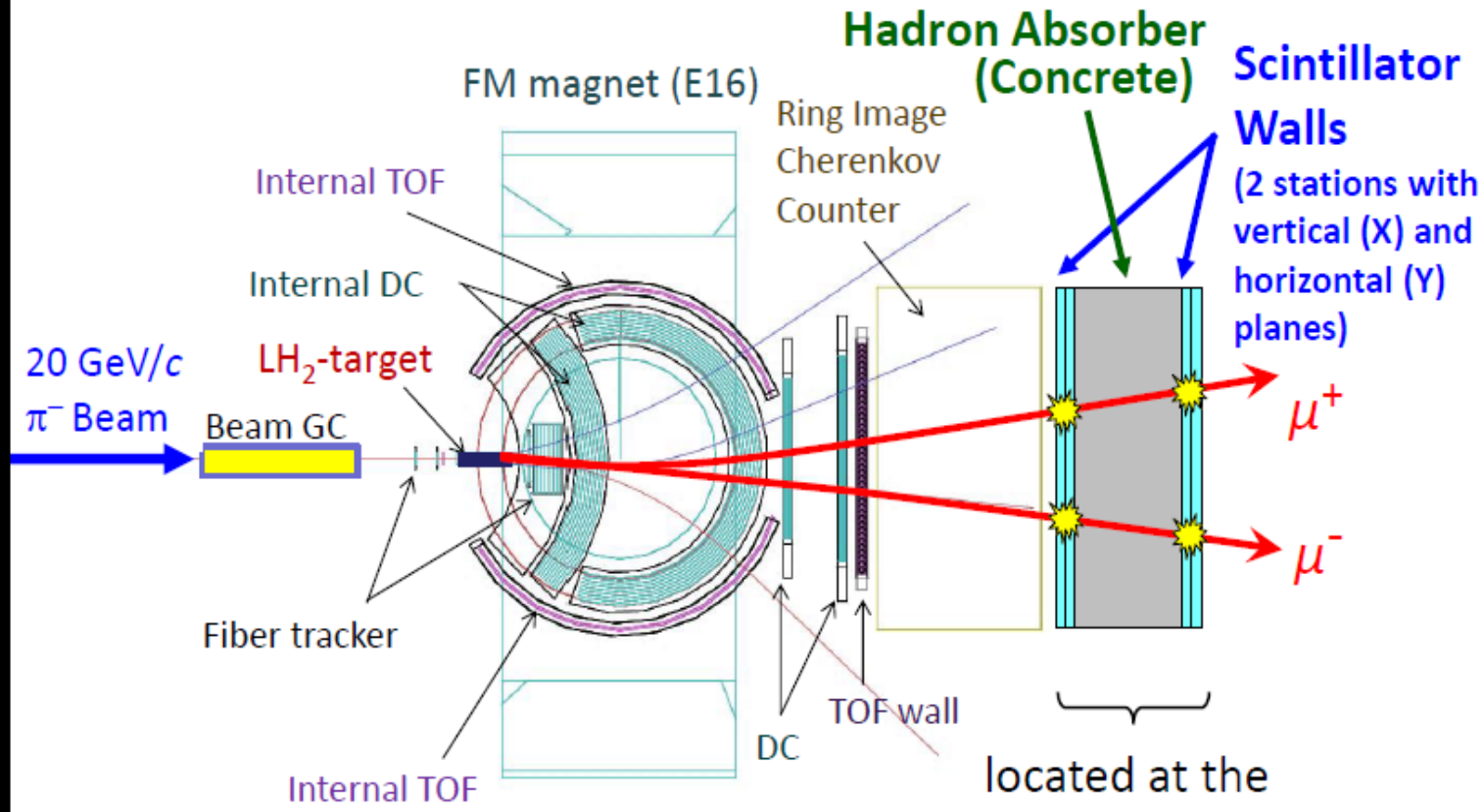
Streaming DAQ for E50

By H. Sako (JAEA)

Muon ID

By T. Sawada (Academia Sinica)

Conceptual design of muon identification system for the J-PARC E50



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Collaborations are expanding…