Constraints in 2010 Jan.-2011 Jun.

- Overall
  - No operation from July to September
- SX
  1. Construction work at the T1 target area 10.Mar-June
  2. Beam dump (governmental inspection) < 5kW
  3. Beam loss (98% extraction efficiency)
  4. 25W loss limit < 5kW
  5. (K1.8 or K1.8BR) + KL + K1.1BR three BLs can run simultaneously IF Ni/Pt target is OK for both
  6. Spill structure
- FX

  Limited by beam power and running time

2010 March to June

Sakashita

What we aim for by the summer 2010 based on realistic beam power estimation

collect physics data and extract

- absolute number of events @Near Detector
- ν energy spectrum measurement @Near Detector
- SK events

to prove T2K analysis strategy

	# of expected events before summer 2010
INGRID int. events [*]	290 x 10^3
Off-axis CCQE int. events [**]	7 x 10^3
Off-axis NCπ^0 int. events in FGD/POD[***]	~975/~2450
Off-axis beam nue int. events [**]	152
SK FCFV events	37
SK ν_e sig. (bkg.) [$\sin^2 2\theta_{13}$=0.1]	1.4 (0.3)

[*] INGRID center module(5ton) [***] in POD (5ton)
[**] in FGD (/2modules=1.99ton)

Using these data,
we are able to prove T2K analysis strategy
and check any unexpected

	Title of the experiment	Approval status (PAC recommendation)	Beamline
E03	Measurement of X rays from Ξ^- Atom	Stage 2	K1.8
P04	Measurement of High-Mass Dimuon Production at the 50-GeV Proton Synchrotron	Deferred	Primaly
E05	Spectroscopic Study of Ξ-Hypernucleus, $^{12}_{\Xi}$Be, via the ^{12}C(K^-, K^+) Reaction	Stage 2	K1.8
E06	Measurement of T-violating Transverse Muon Polarization in $K^+ \to \pi^0 \mu^+ \nu$ Decays	Stage 1	K1.1BR
E07	Systematic Study of Double Strangeness System with an Emulsion-counter Hybrid Method	Stage 2	K1.8
E08	Pion double charge exchange on oxygen at J-PARC	Stage 1	K1.8
E10	Production of Neutron-Rich Lambda-Hypernuclei with the Double Charge-Exchange Reaction (Revised from Initial P10)	Stage 2	K1.8
E11	Tokai-to-Kamioka (T2K) Long Baseline Neutrino Oscillation Experimental Proposal	Stage 2	neutrino
E13	Gamma-ray spectroscopy of light hypernuclei	Stage 2	K1.8
E14	Proposal for $K_L \to \pi^0 \nu\bar{\nu}$ Experiment at J-PARC	Stage 2	KO
E15	A Search for deeply-bound kaonic nuclear states by in-flight 3He(K-, n) reaction	Stage 2	K1.8BR
E16	Electron pair spectrometer at the J-PARC 50-GeV PS to explore the chiral symmetry in QCD	Stage 1	High pt
E17	Precision spectroscopy of Kaonic ^{3}He 3d->2p X-rays	Stage 2	K1.8BR
E18	Coincidence Measurement of the Weak Decay of $^{12}_{\Lambda}$C and the three-body weak interaction process	Stage 1	K1.8
E19	High-resolution Search for Θ^+ Pentaquark in $\pi^- p \to K^- X$ Reactions	Stage 2	K1.8
E21	An Experimental Search for $\mu^- - e^-$ Conversion at a Sensitivity of 10^{-16} with a Slow-Extracted Bunched Beam	Stage 1	New beamline
E22	Exclusive Study on the Lambda-N Weak Interaction in A=4 Lambda-Hypernuclei (Revised from Initial P10)	Stage 1	K1.8
T25	Extinction Measurement of J-PARC Proton Beam at K1.8BR	test experiment	K1.8BR
P26	Direct measurements of omega mass modifcation in A(pi $^-$,n)omega reaction and omega -> pi0 gamma decays	Deferred	K1.8
E27	Search for a nuclear Kbar bound state K^-pp in the d(π^+, K^+) reaction	Stage 1	K1.8

K1.8

Takahashi

- Resolution check & Calibration (2010 Jan. & Feb.)
  - $\pi^- + p \rightarrow p + \pi^-$ at 0.5 GeV/c with CH_2/Liq-H_2 a few hours
  - $\pi^- + p \rightarrow K^+ + \Sigma^-$ at 1.25 GeV/c with CH_2/Liq-H_2 3/1 days
  - ($^{12}C(\pi^+,K^+)^{12}_{\Lambda}C$ at 1.05 GeV/c) if possible
- E19 ($\pi^- + p \rightarrow K^- + \Theta^+$)
  - Step-1: 10σ at 1.92GeV/c (2010 Autumn) 10 days
  - Step-2: 1.44x10^{12} pions at 1.87, 1.92, 1.97GeV/c
- Other experiments

Starting with 500k/spill intensity, it gradually increases according to the improvements of time-structure of the beam and analysis methods.

240W, Ni assumed, limited by spill structure

K1.8BR

SUMMARY

Hayano

500 K^-/spill/kW @ 0.75 MeV/c with Ni target

- ES1 works very well; we can take data with ~100 kW beam even with the present spill time structure
- Further studies planned in run#29 & 30 (comparison of measured and calculated optics)

E17 is ready to run in Fall 2010

- needs 3 days for stopped-K^- optimization, and 7 days of detector commissioning (as in the proposal)

Completion of E17 will take 30 weeks

- Assumption: 1 kW DC beam, Ni target

Not limited by Spill structure

Pt target is preferred over Ni (x2 gain)

Nomura

KOTO timeline

- 2009: Beamline survey
- 2010: Partial engineering run
  - Year of CsI calorimeter
    - Construction, installation, and engineering run at J-PARC
    - Evaluate beam properties with full KOTO calorimeter
- 2011: Full engineering and Start physics run

➔ 1st milestone:
Grossman-Nir limit
by summer 2012 (~30kW x 1month)

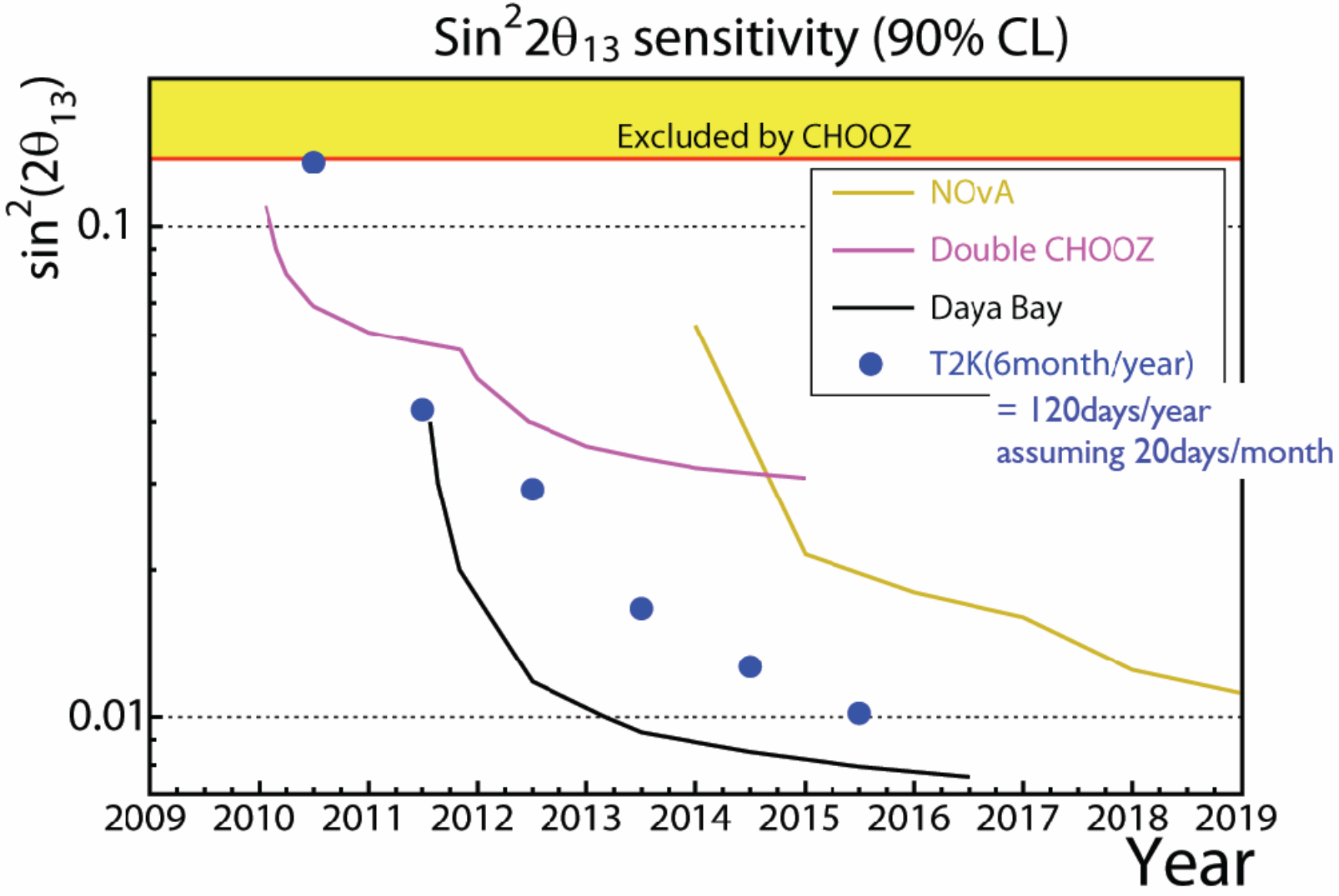
Pt target is OK

Request Ni run for future

** Need original Ni disk target for high power operation

After summer 2010

Sakashita



Request beam time of more than 10^7 sec(=~120days) per year in order to keep leading international competition

2010 Jan, Feb. (Ni in SX)

- K1.8 (SKS) : Liq.H target calibration & setting up trigger
- K1.8BR : E17 tuning
- KL : yield measurement, momentum spectrum、Ni target
- FX T2K tuning

2010 March-June

- SX : Construction of K1.1BR and working at SX target area, no beam
- FX : T2K data taking

Requests

2010 October~ 2011 June ~150 days if same operation mode

- K1.8 : E19 240W × 10days (with better spill structure 500W can be used)
- K1.8BR : E17 30kW × week(Ni)、with Pt target 105days @1kW
- KL : CSI calorimeter at several kW, no preference of Ni/Pt
- K1.1BR : Commissioning, test beam
- FX > 100kW for 120 days

Reference

AN EXPECTED BEAM POWER CURVES FOR RCS AND MR FAST BEAM EXTRACTION

★1.7MW

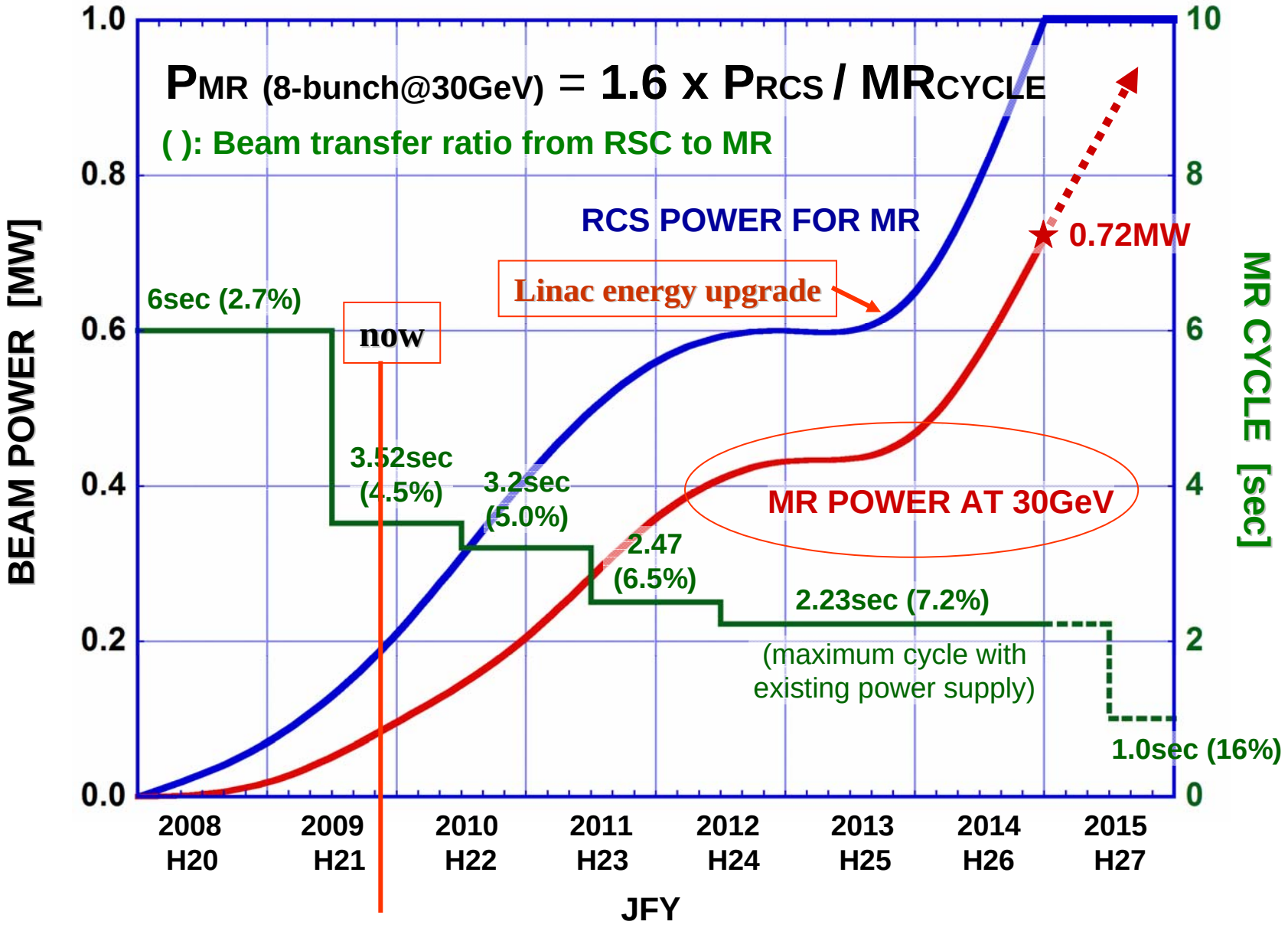
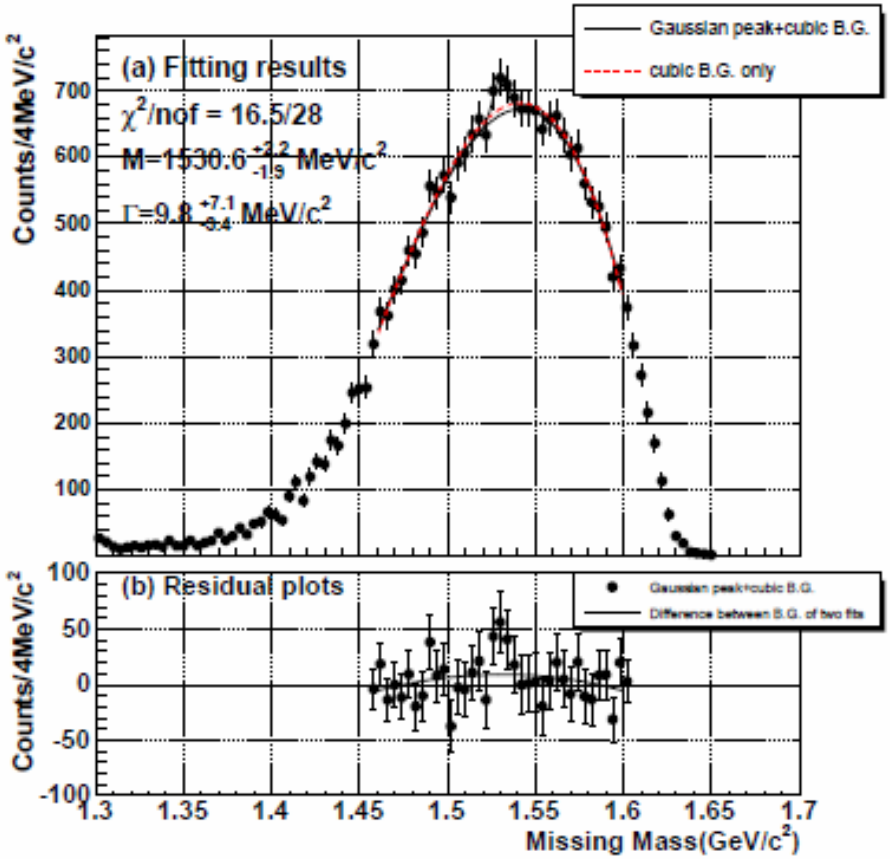


Figure 4: Missing mass spectrum of the (π^-, K^-) reaction at 1.87 GeV/c (a) and 1.92 GeV/c (b). The hatched histograms are the carbon target data which are normalized by the number of target and beam particles, and these histograms represent the contribution from carbon nuclei in SCIFI and polyethylene targets. The spectra where missing mass is less than 1.45 GeV/c^2 are well reproduced by these carbon target data, because kinematically these events are dominantly from the carbon nuclei.



KEKPS E522

Figure 5: Missing mass spectrum of the (π^-, K^-) reaction at 1.92 GeV/c. (a) We fitted this