Agenda

1. Motivation for commissioning detector
   (BEAST / BEAST-II)
2. New commissioning scenario and schedule
3. Material needed for Director's review
4. **Clearly defining the Hawaii contribution**
5. Follow-up items

1. Motivation for Commissioning Detector

- Beam-induced backgrounds in Belle2, predicted by either simulation or Belle→Belle2 scaling: large uncertainty
- Desirable to measure backgrounds before Belle2 roll-in
  - Ensure environment near IP safe for Belle2 detector
  - Provide feedback to accelerator during beam commissioning
  - Understand relative importance of different BG mechanisms (Touschek, Radiative Bhabba, Beam gas, etc)

  →Validate/tune Belle2 background simulation

→Ideally, measure distribution, direction & spectra of

  - charged particles, x-rays, neutrons

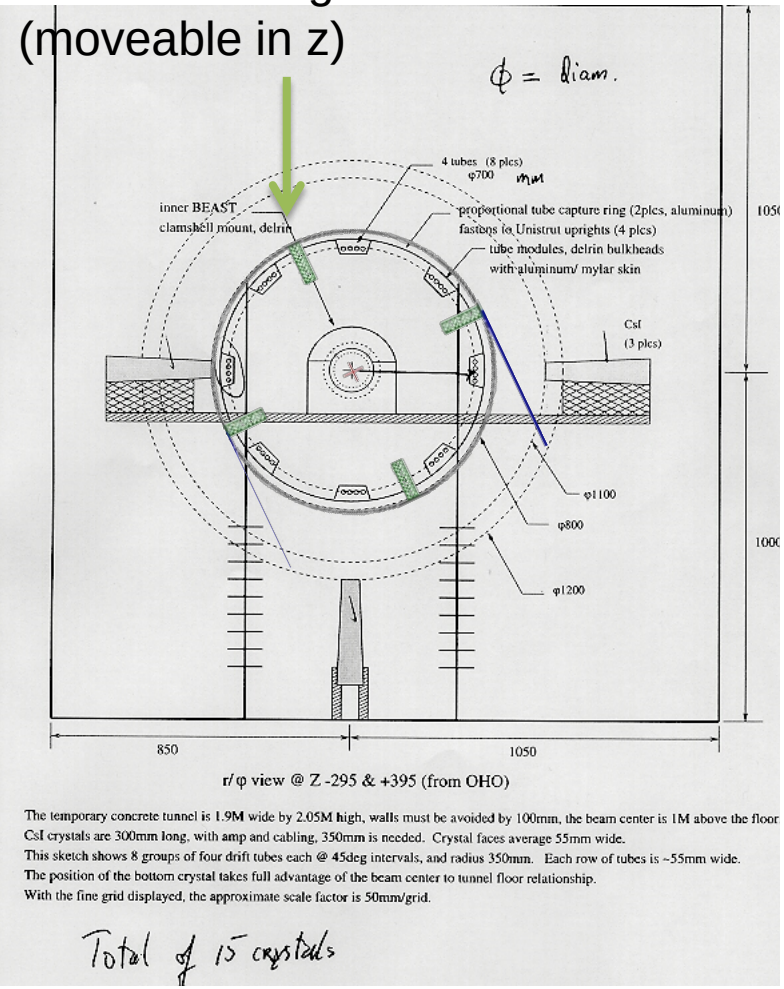
- ~~Belle2 schedule announced at Nagoya BGM, has ~1-year commissioning period, starting Sep '14~~

KEKB Commissioning in 1998

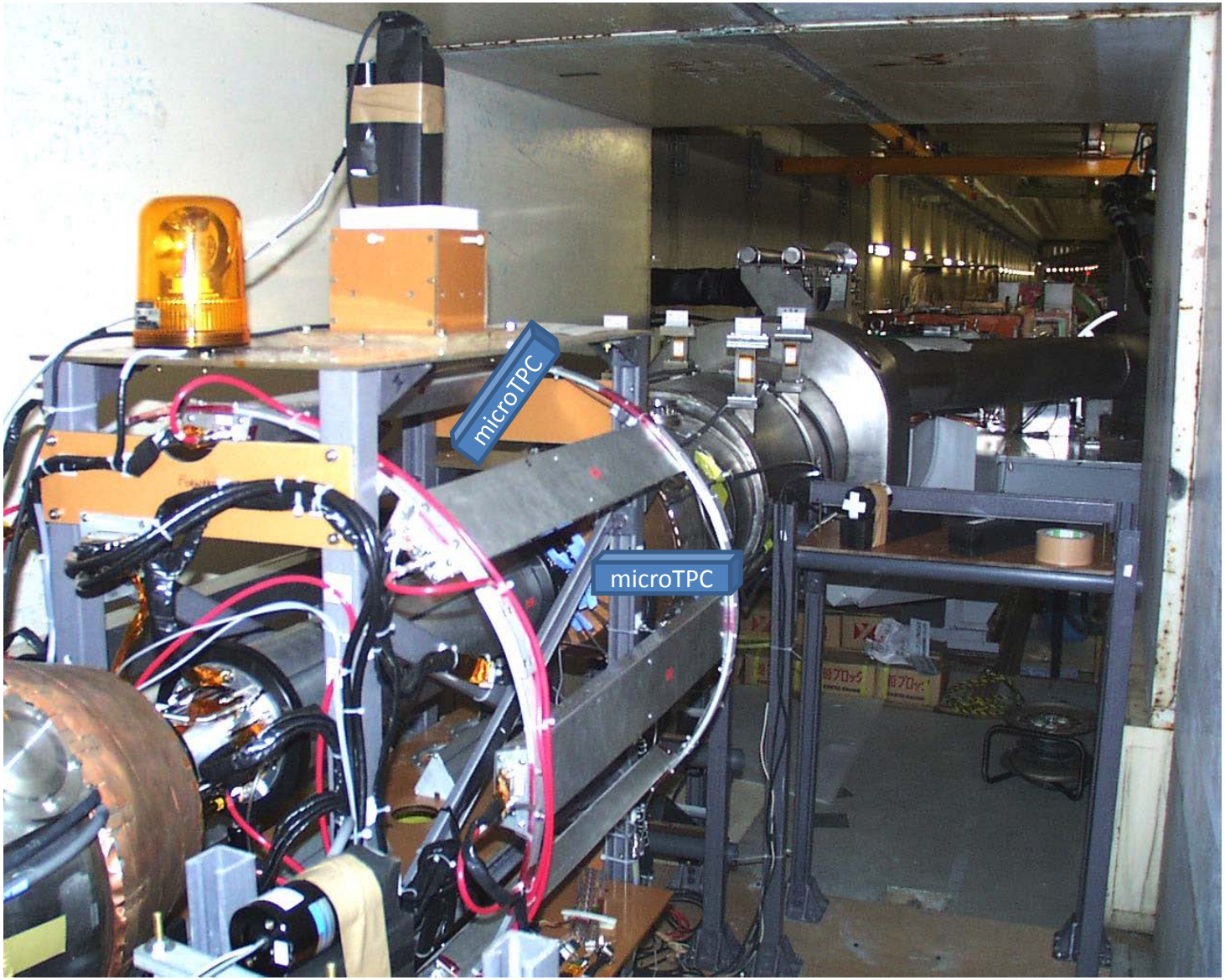
BEAST: Background Exorcism for a Stable BELLE Experiment

- Non-magnetic support structure surrounding IP
- No solenoid / Belle rolled out
- Particle/Radiation monitoring
  - Drift tubes (at r=7 and r=45 cm)
  - PIN diodes
  - MOSFETs
- Belle Detector Elements
  - CSI(Tl) Crystals
  - Two Silicon Strip Ladders
- Collaboration of KEK, Melbourne, Sydney, Hawaii, Cracow, BINP Novisibirsk, NTU

Micro TPC in green (moveable in z)



The BEAST in the Cave



New Schedule

The new schedule can be found at http://ekpbelle2.physik.uni-karlsruhe.de/~twiki/bin/view/Detector/BelleIISchedule. Its main points are

- QCS will be ready when the machine is ready (Oct 2014)
- **Beast II will run with QCS in from October 2014 until March 2015**
- Belle II will start running in Dec 2015, one long run until summer 2016 shutdown.

Note that sub-detectors should be constructed well before the specified deadline so that they can be commissioned, their read-out and control can be debugged, and DAQ and slow control software can be developed to the final shape. Please allow also some margin in the sub-detector construction schedule because we are searching for additional sources of finances which could accelerate the schedule; we will know more in the next two weeks.

Since the machine cannot be commissioned without the Belle solenoid in place, we will have to
- start installing the inner detectors (iTOP, CDC, SVD, PXD) once Belle is rolled out after Beast II operation is finished (March 2015)
- run Beast II with the barrel calorimeter in place

Regarding the second point, we are investigating how to protect the calorimeter from radiation damage during the early commissioning phase.

Note also that some fine details in the schedule of QCS installation and start of Beast II operation might change without an impact on the overall schedule.

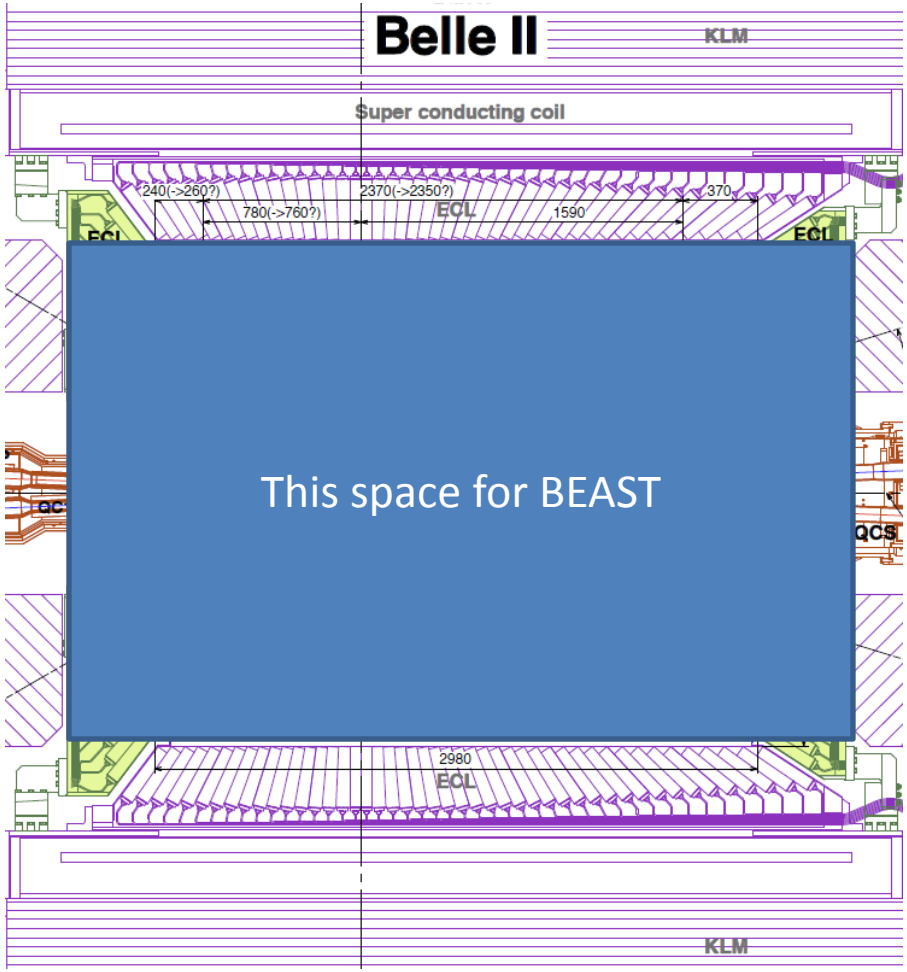
We will prepare a simplified version of the new schedule which can then be used for public presentations.

Yours
Peter Krizan

→ **How does this impact our plans?** OK, WBS updated.

New Commissioning Scenario

We roll-in the Belle solenoid + KLM and ECL without endcaps/TOP/CDC/SVD/PXD.



- BEAST (minus barrel crystals) + pixel ladder(s) and microTPCs would fit
- Solenoid field is a major bonus for accelerator commissioning and extrapolating BEAST measurements to Belle2
- In this case, would want TPC drift field in z-direction (same direction as magnetic field)

Director's Review

- Week of Dec 12 at PNNL (exact date?)
- Needed well before then:
  - WBS (work breakdown statement)
  - CDR (conceptual design report)
    - draft requested by ***Monday***
  - *Presentation*
    - ***draft requested early November***
      - WBS scope {What will your task do?}
      - Performance requirements
      - Technical status
      - Cost {Paul will provide slides to each L2}
      - Schedule and milestones {Slide from Paul}
      - Risks {L2 should gather for Risk Plan}
      - Workforce {Project and grant resources}
      - Summary

Defining the Hawaii contribution

Your input highly welcome!

- *We need to clearly define, in a way that is defensible at director's review.*
  - *Need for commissioning detector*
  - *Scope of the Hawaii contribution,*

- *Definition of scoe not easy, I'm a bit concerned*
  - *Commissioning scenario just decided on at KEK. No agreement on BeastII design yet.*
  - *Hawaii work, according to WBS, not starting until November: 1 year of simulation studies, resulting in BEASTII design*
  - ***It is too early to say exactly what we're planning to build!***

- *What scenario to present in CDR and at Director's Review?*
  - Performance requirements
  - Technical status

- *Currently in WBS: Ilsoo, Michael, Igal, Sven, Marc (all part time)*
  - *Design + build support structure*
  - *Simulate BGs and decide placement of BEAST sub-detectors*
  - *(add?) Beam BG simulation → simulation of calorimeter shielding*
  - *Tracking devices*
    - *TPCs. Depends on R&D progress, which is not in WBS. Main worry: robustness.*
    - *What is our strategy? Include TPC alternative in WBS? Straws? Diodes?*

Follow-up items

- Sven: Create WIKI with documentation
  - BEAST TDR, BG simulation note, WBS, CDR, Draft talk
- Sven (in consultation w/ Tom, Gary): Clear need statement, well defined scope of US contribution
- Michael + Ilsoo: Understand past results on belle2 bg simulation. Longer term: Michael learn to run simulation, design calorimeter shielding.
- Longer term: Ilsoo (w/ help from Igal): interface GEANT TPC simulation to Belle2 beam BGsimulation