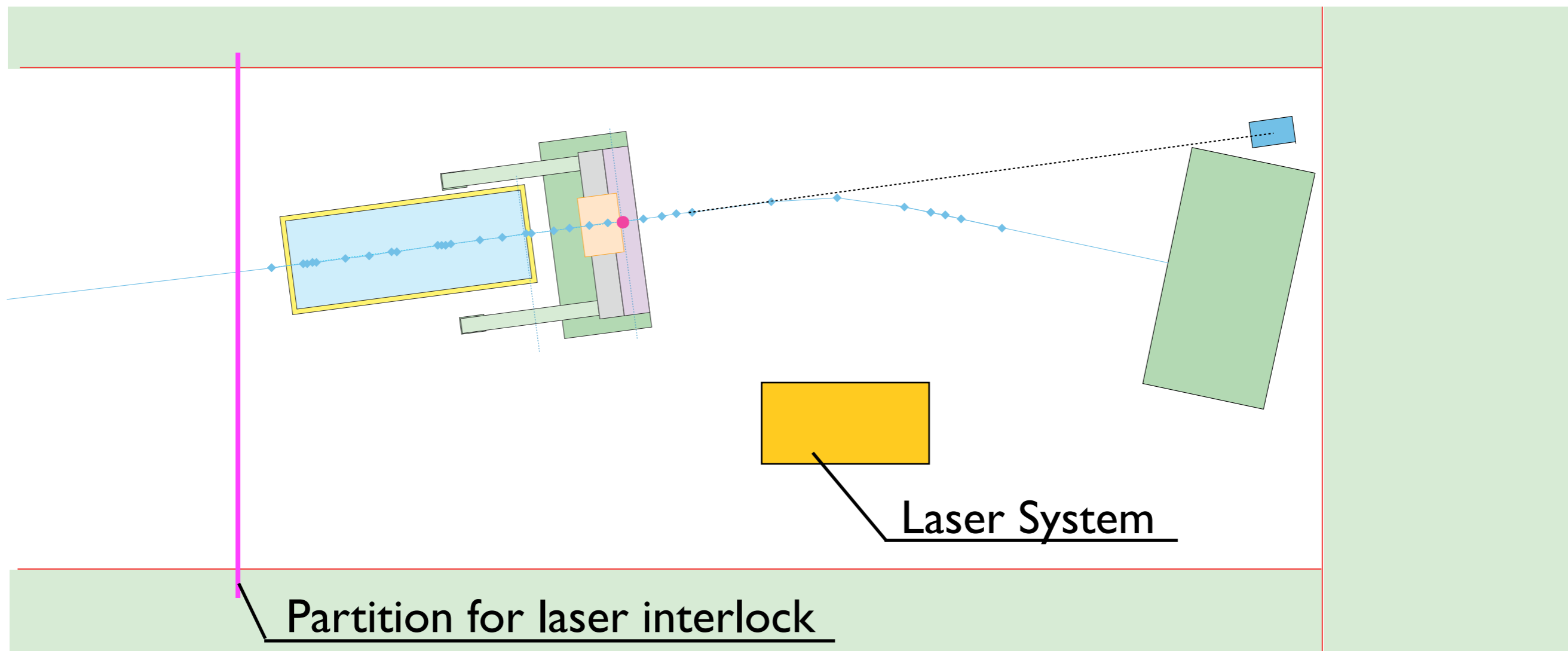
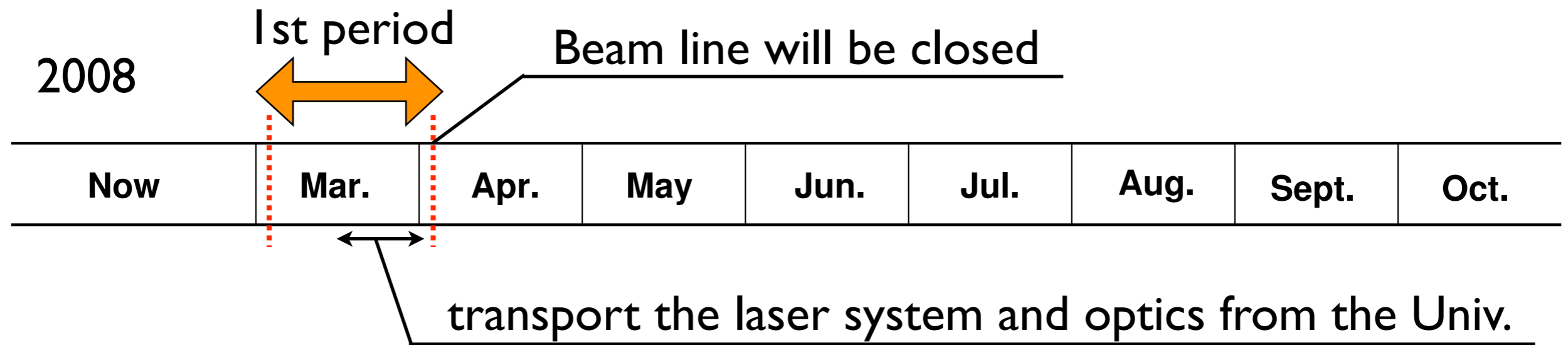


Current Status of the Shintake-Monitor

Y. Kamiya, M. Oroku, T. Yamanaka, and S. Komamiya
the Univ. of Tokyo

T. Tauchi, N. Terunuma, Y. Honda, and T. Kume
KEK



The laser system and the optical table were installed around the IP.

Beam line will be closed 2nd period Open the roof again

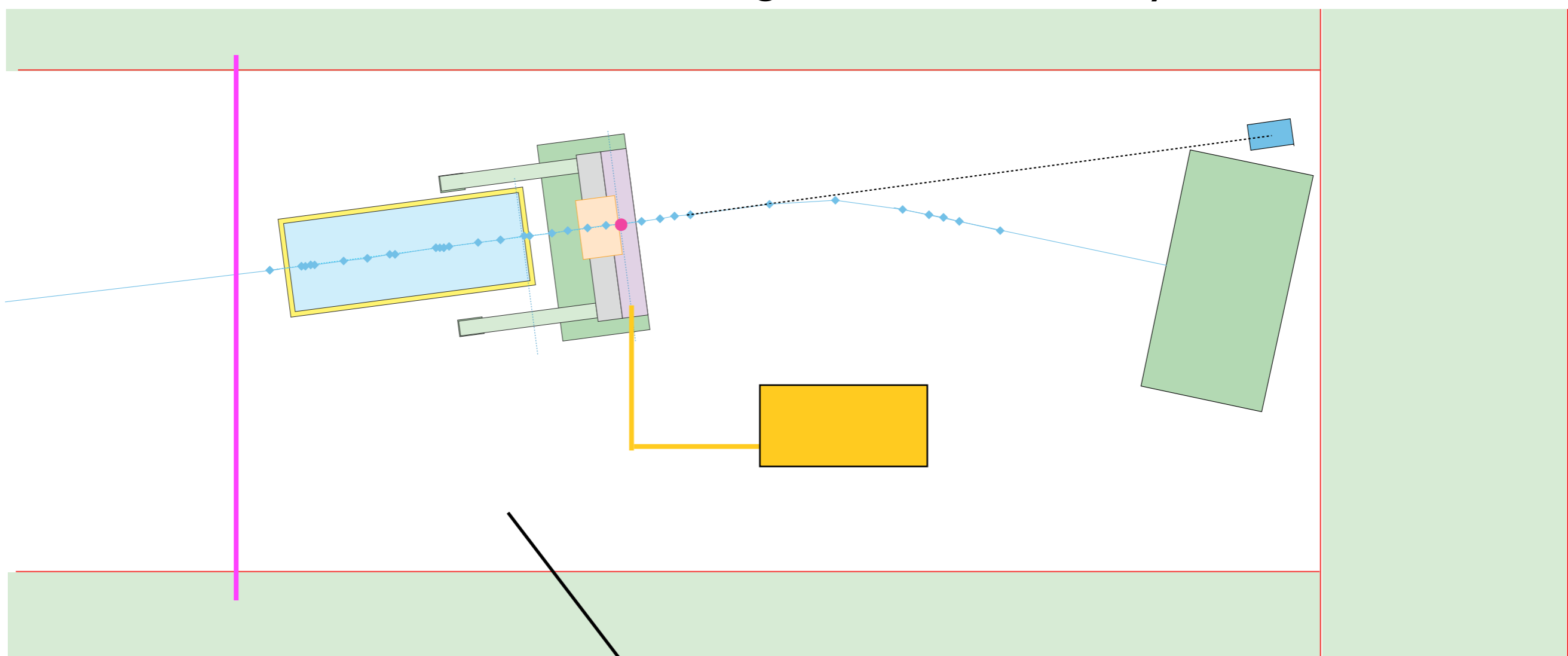
2008 planed



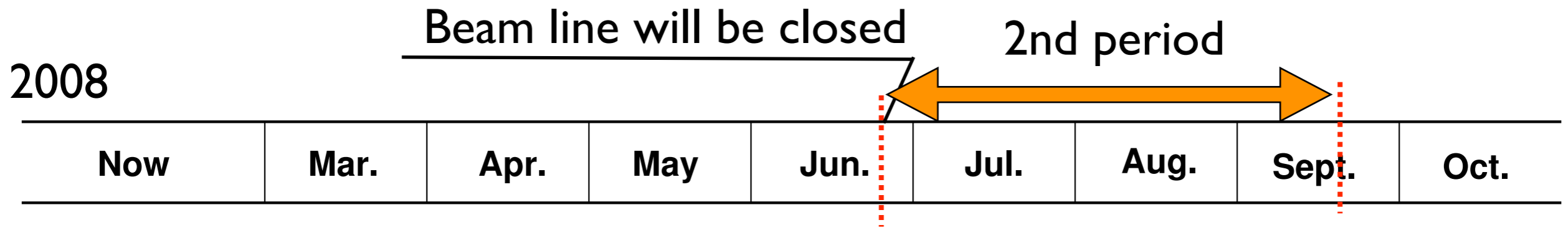
Now	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.
-----	------	------	-----	------	------	------	-------	------

What we will do

- Construct new optics on the table
- Test the integrated stabilization system

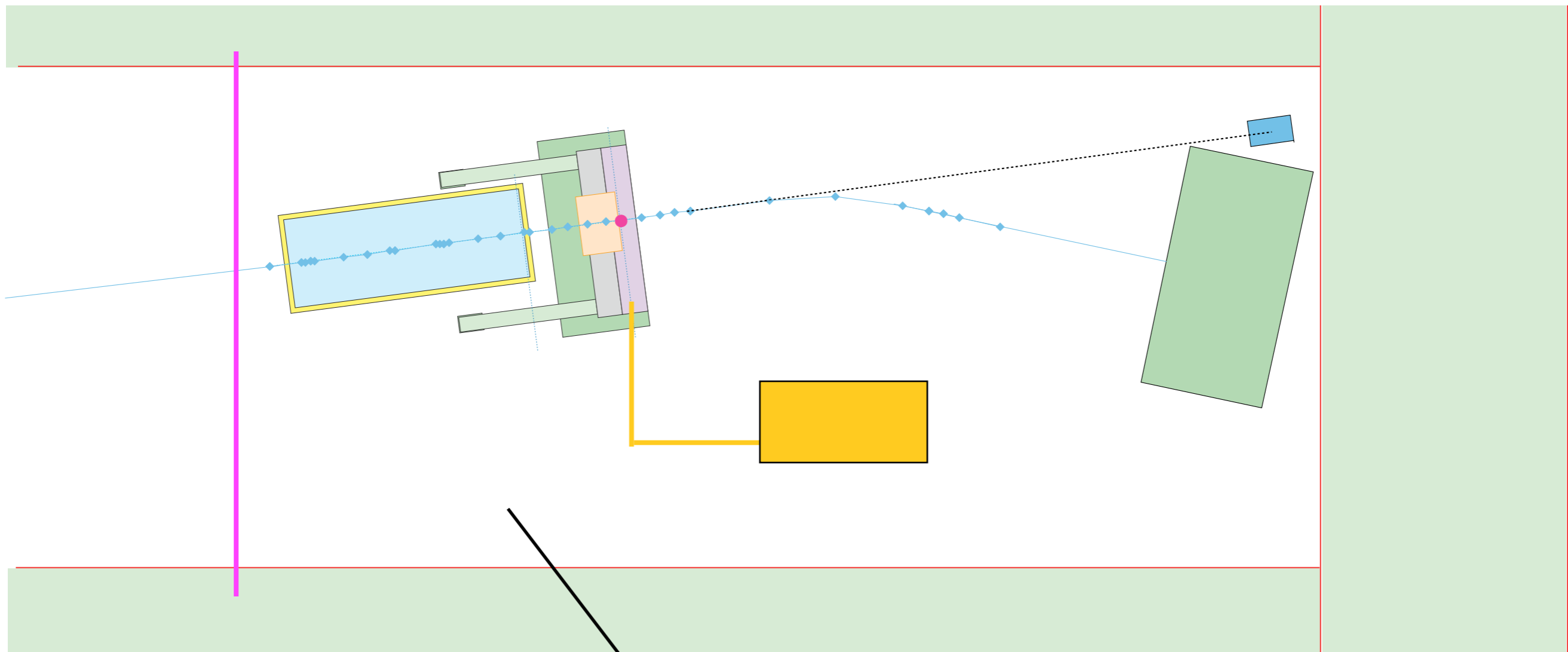


Restricted area for the laser operation



What we will do

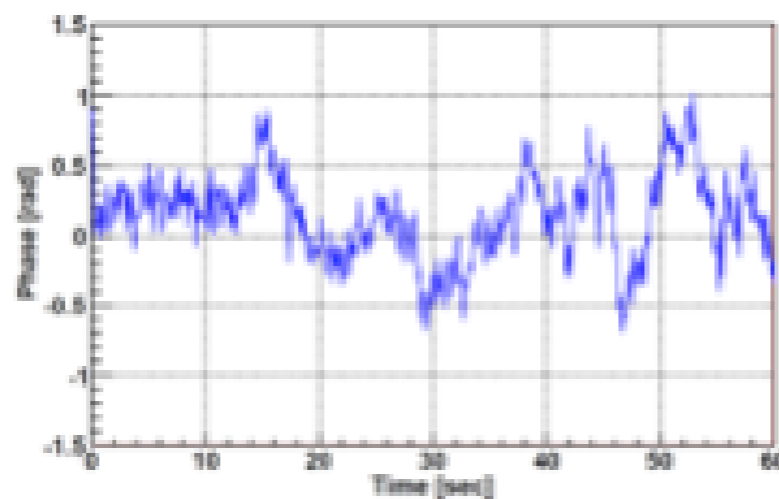
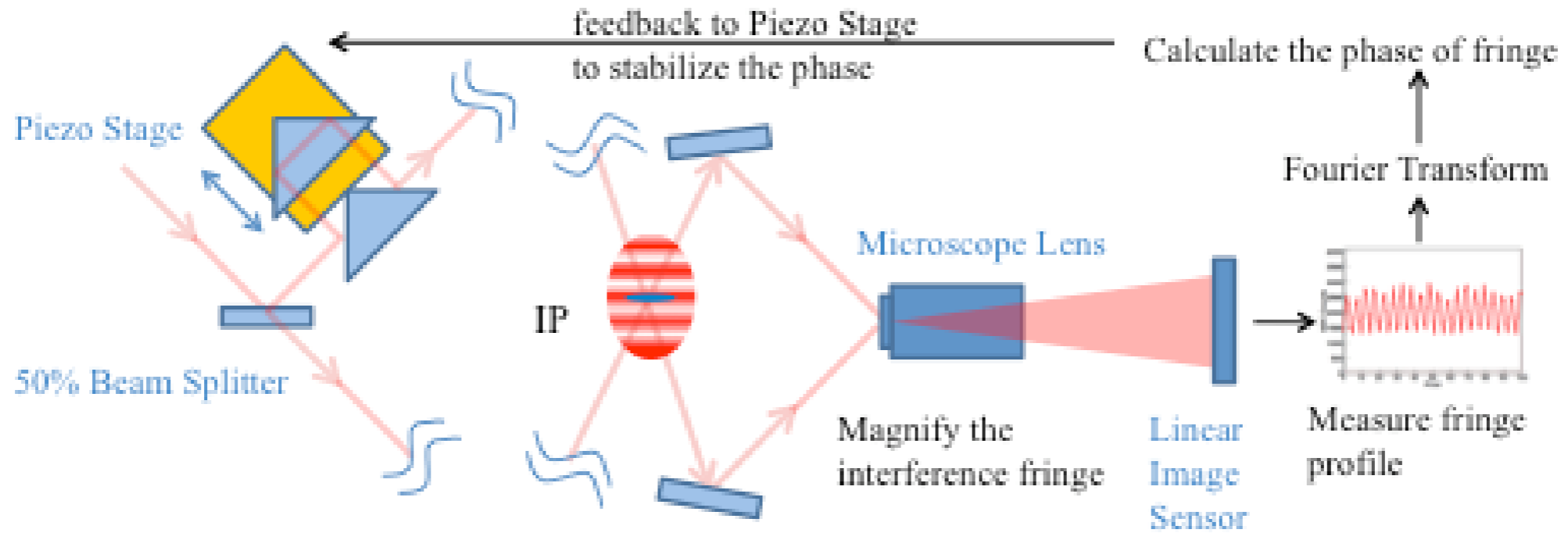
- Construct new optics on the table
- Test the integrated stabilization system



Restricted area for the laser operation

Using this short laser line, the error sources for the size measurement was evaluated.

Phase Jitter on Laser Fringe



Stabilized : 320 ± 40 mrad (RMS)

Estimated Phase Stability at the IP is 320 mrad
corresponds to 13.5 nm jitter @ 266 nm pitch

Error budget for the scattered plot

before correction

after correction

Error to gamma-ray intensity

A1. Detector resolution

~ 7.5 %

A2. Power jitter

A2.1 laser power jitter

3 %

1 % (using a photodiode)

A2.2 electron current jitter

9 %

1 % (using an ICT)

A2.2 laser position jitter

4 %

0.5 % (using PSDs)

A2.3 timing jitter

A2.3.1 laser timing jitter

0.7 %

(400 psec for 3.4 nsec pulse duration)

A2.3.2 electron timing

4 %

(fine structure of the laser in order of 16 psec)

Total 9 %

Error to the relative position (phase)

B1. phase jitter on laser fringe

16.9 nm

13.5 nm
(using phase stabilizer)

B2. electron position jitter

~ 30 nm

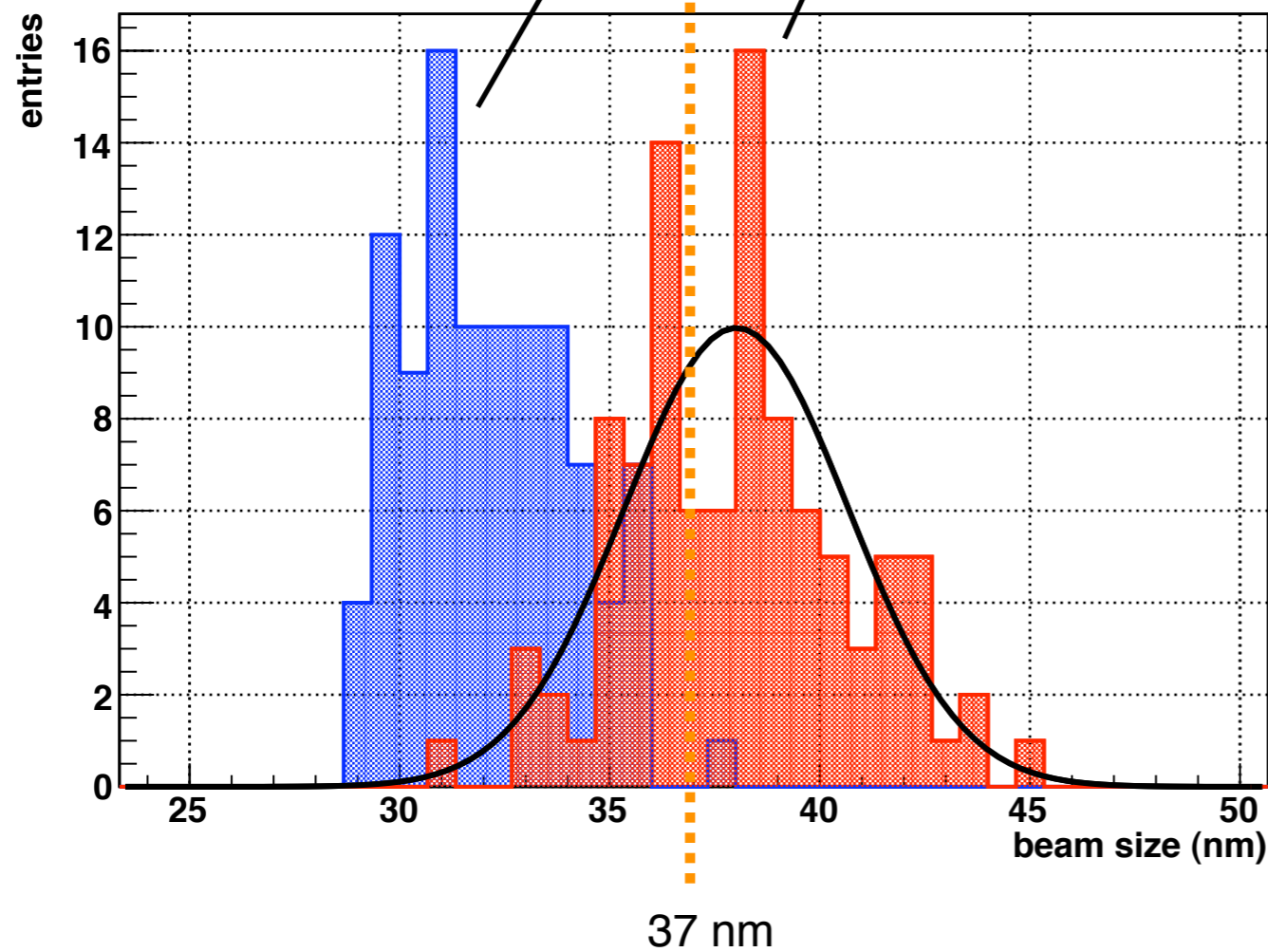
8.7 nm (using IP-BPM)

Total 16 nm for 266 nm pitch

Expected distribution of the beam size measurement on the 37 nm beam size with 10% intensity error and 15 nm position error

2nd procedure
(find min. and max.)

1st procedure (curve fitting)



estimated beam size:
38 nm

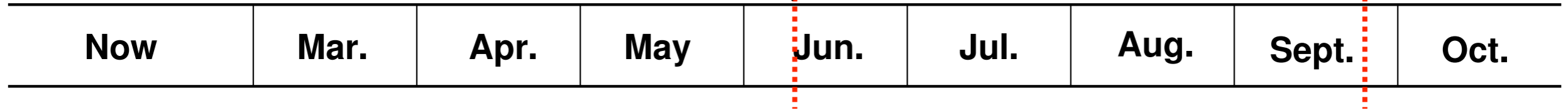
resolution of a measurement:
2.7 nm

1st procedure (curve fitting) is better
for the currently estimated errors

2008

Open the roof again

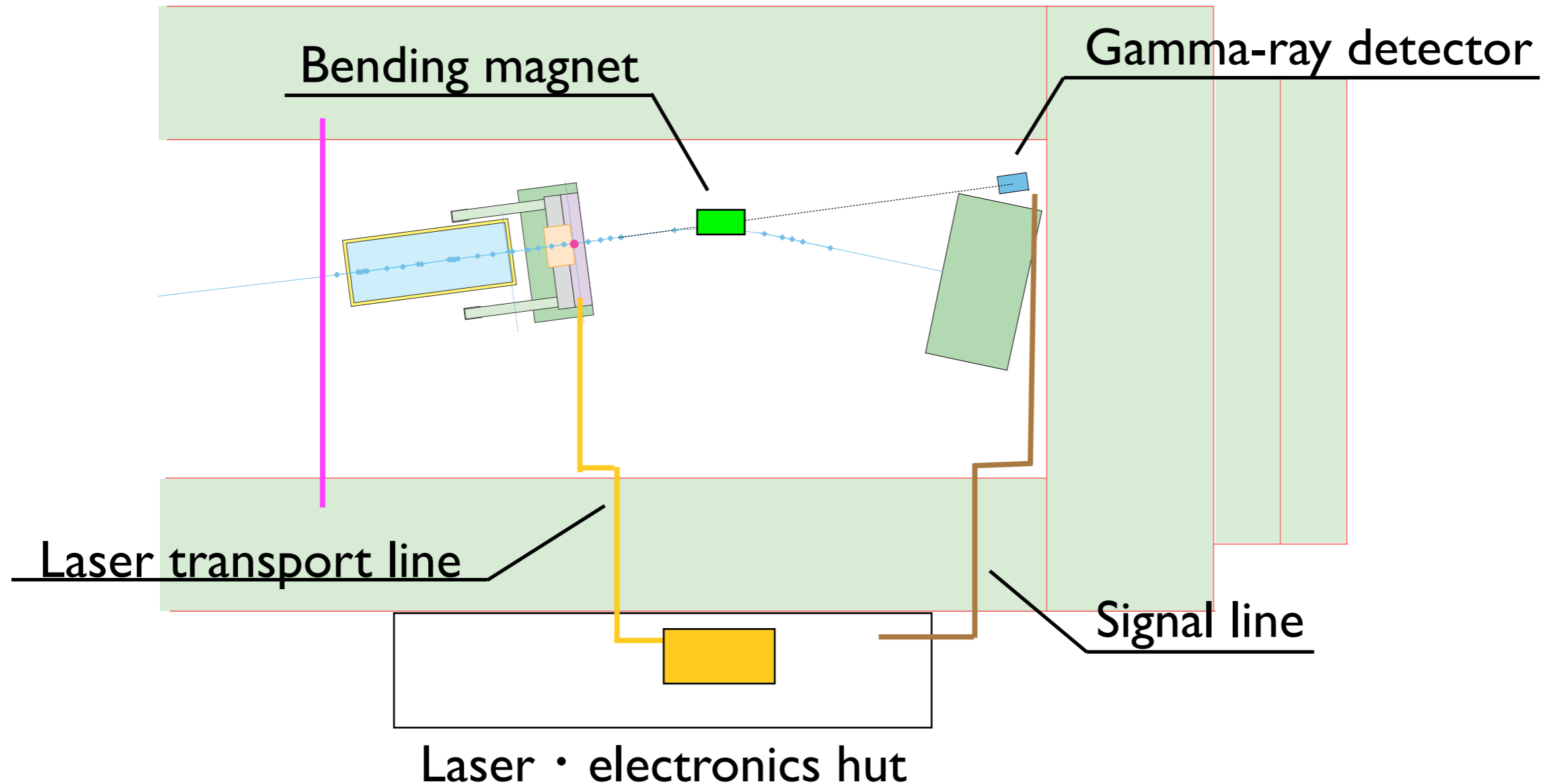
3rd period



What we will do

- Tune the laser transport line
- Keep optics studies, etc...

Commissioning Start !!



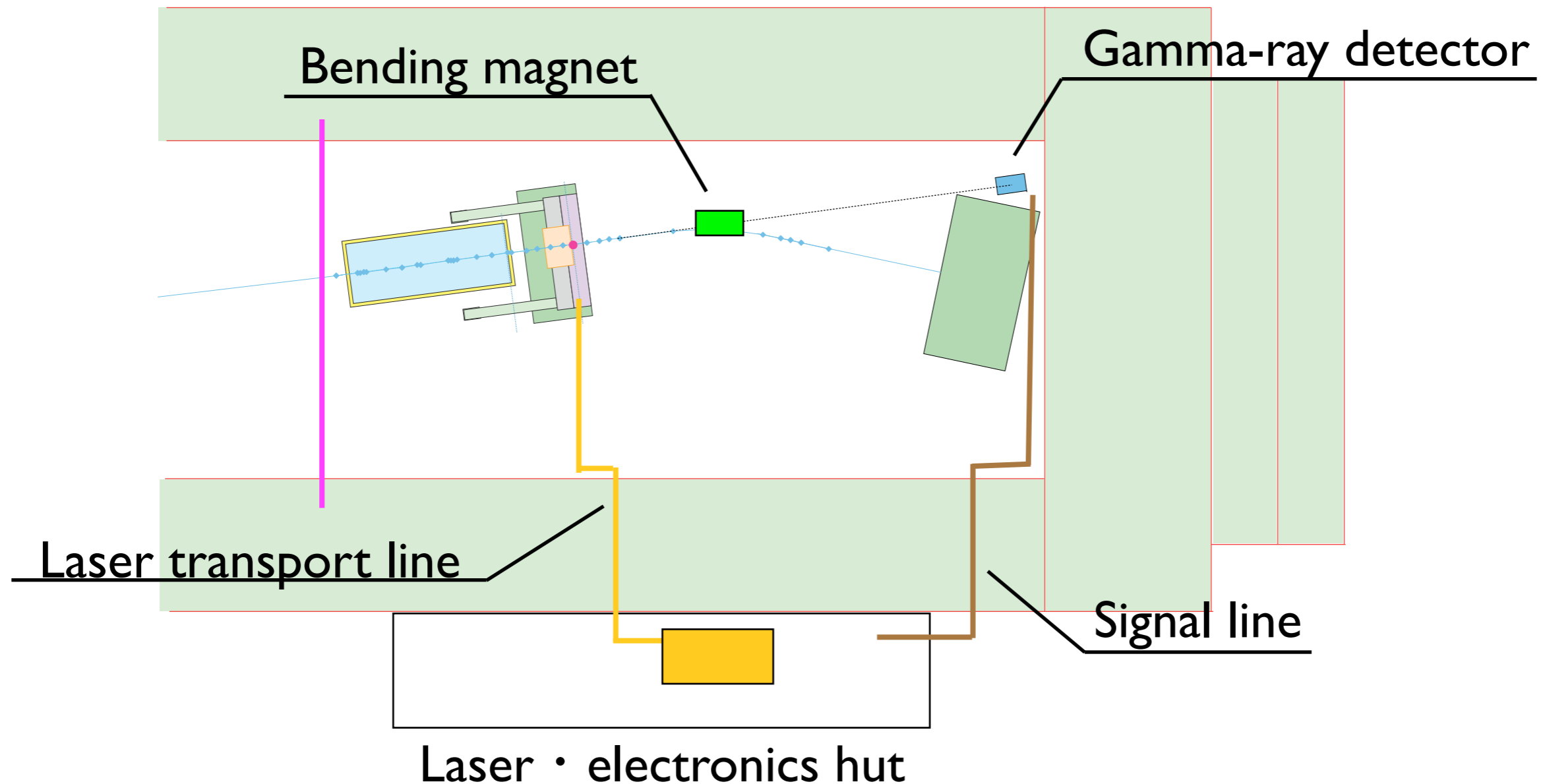
2008

Now	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.
-----	------	------	-----	------	------	------	-------	------

What we will do

- Tune the laser transport line
- Keep optics studies, etc...

Commissioning Start !!



5 modes of the Shintake monitor for ATF2

- Laser Wire mode (horizontal size)
- 2 deg. Shintake mode (1 - 6 microns)
- 8 deg. Shintake mode (0.3 - 2 microns)
- 30 deg. Shintake mode (80 - 400 nm)
- 174 deg. Shintake mode (20 - 100 nm)

5 modes of the Shintake monitor for ATF2

assembling Schedule

- **Laser Wire mode** (horizontal size)
-

- 2 deg. Shintake mode (1 - 6 microns)

Feb. - Mar

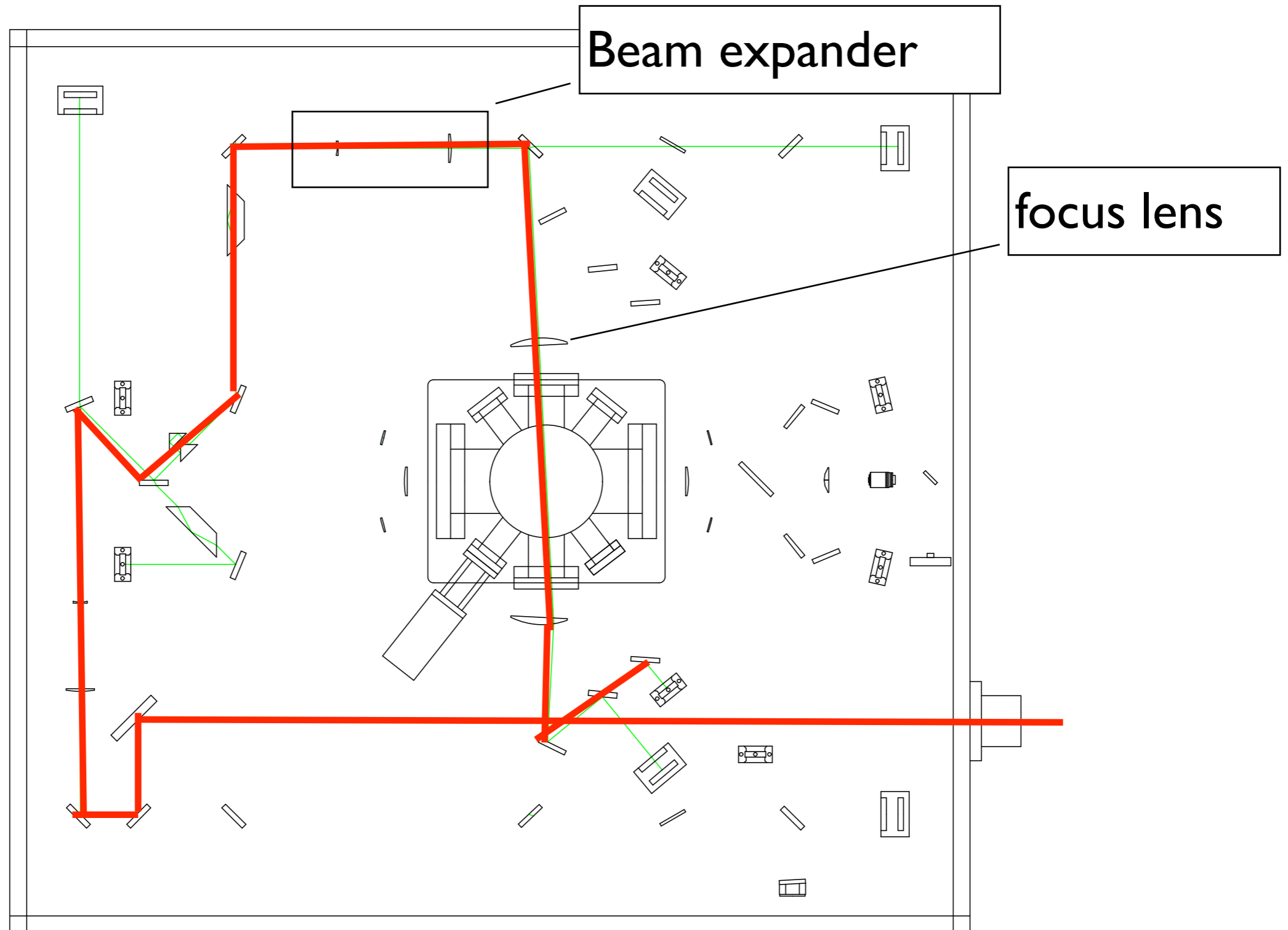
- 8 deg. Shintake mode (0.3 - 2 microns)
-

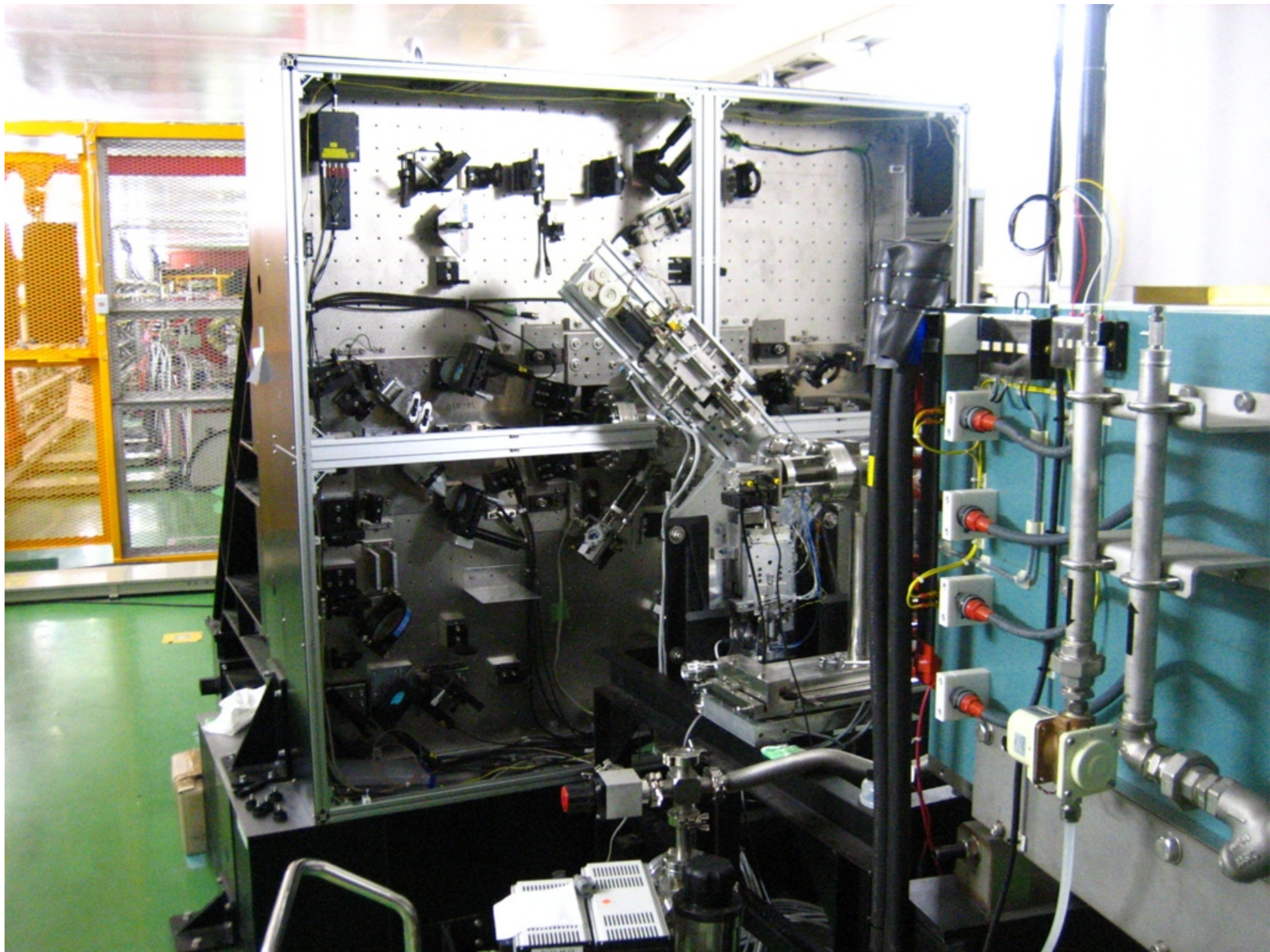
- 30 deg. Shintake mode (80 - 400 nm)

Jul. - Sept.

- 174 deg. Shintake mode (20 - 100 nm)
-

Optical pass in the table (Laser Wire mode)





Summary

Shintake Monitor was installed at the IP.

The error sources was evaluated.

3 nm resolution is expected for 37 nm beam.

We are going to try the Laser Wire mode in this week.

The other Shintake mode will be tested in stages next year.