

Plan

1. Two baseline-monitor interferometers (~2.5km) along LCGT
2. Sensors and benchmarks for monitoring environmental condition

Purpose and Targets

[Baseline interferometers]

1. Baseline monitor for LCGT (Tides, earthquakes, crustal deformation...in the middle of **Niigata Kobe Tectonic Zone**)
2. Fault-creep monitor for the Atotsu fault
3. Deep interior of Earth (Monitoring Earth's free oscillations)

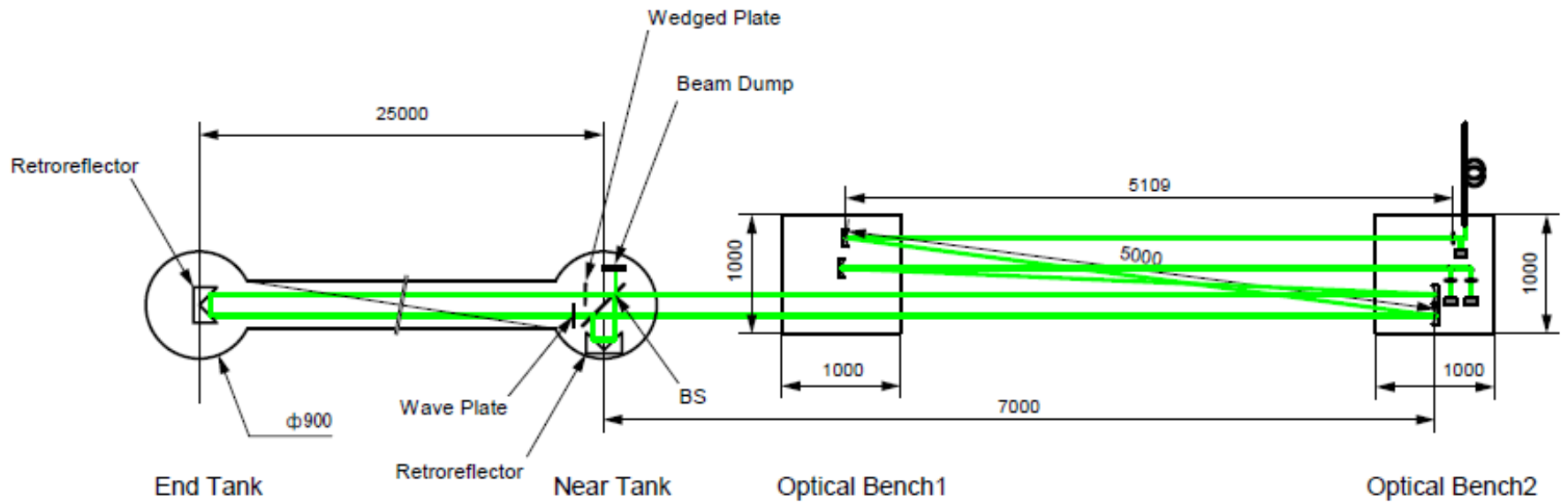
[Sensors and Benchmarks]

1. Monitoring environmental condition (Thermometers, Barometers, Hygrometers, Broadband seismometers, and Accelerometers) and tunnel deformation (leveling and surveying)
2. Standard of length (collaboration with AIST)
3. Benchmarks for vacuum installation

Baseline
Interferometers
along LCGT



LCGT-Geo IFO Optical Layout Plan (2010/08/27)



A 2500-m baseline interferometer and a 5-m input baseline

Layout of vacuum system and benchmarks

Strain sensitivity $\sim 1e-13$

Baseline $\sim 2.5\text{km}$

Chamber diameter 1000mm

Chamber height 800mm

Vacuum pressure $\sim 1e-4\text{Pa}$

Benchmarks 800x800mm,
200-m separation

Sensors

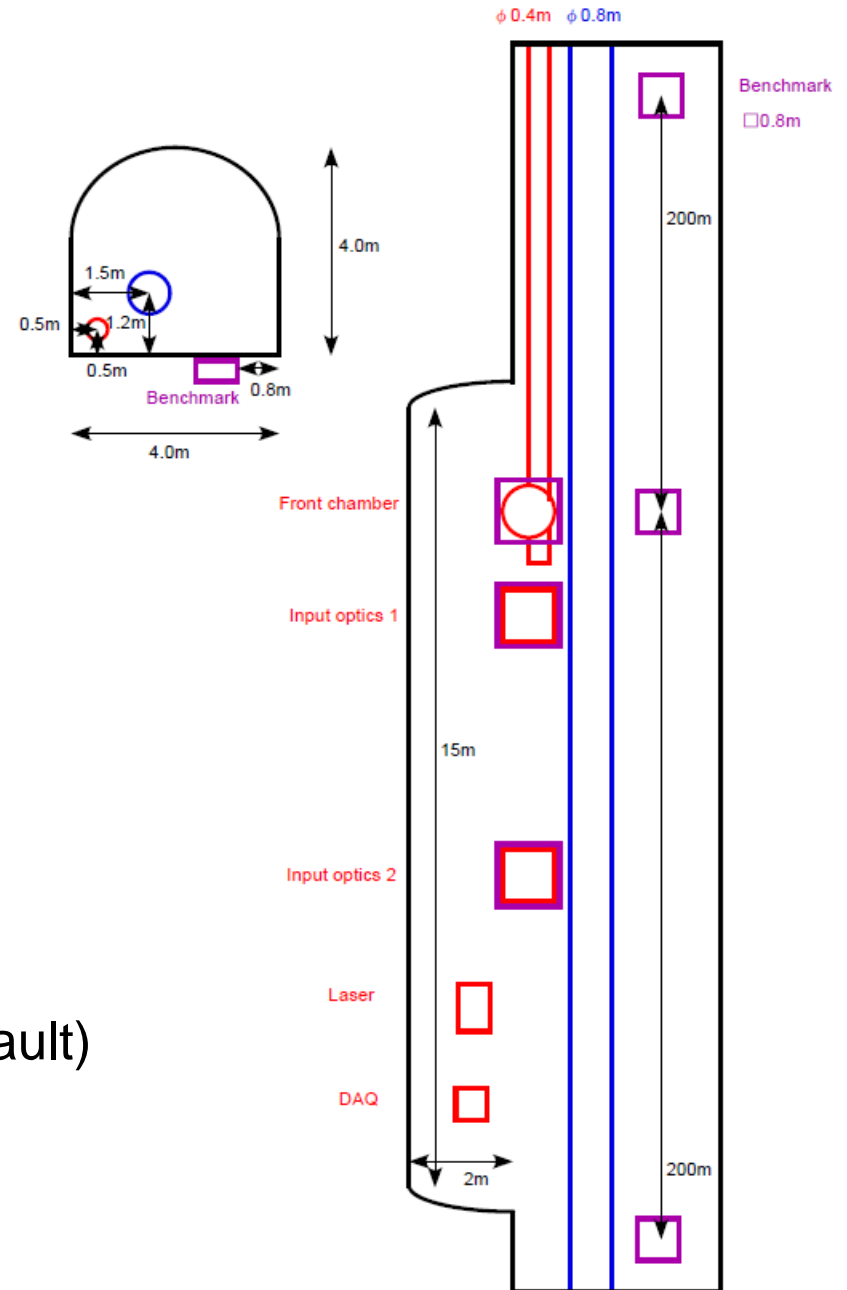
Temperature (laser, chamber, vault)

Barometer (chamber, vault)

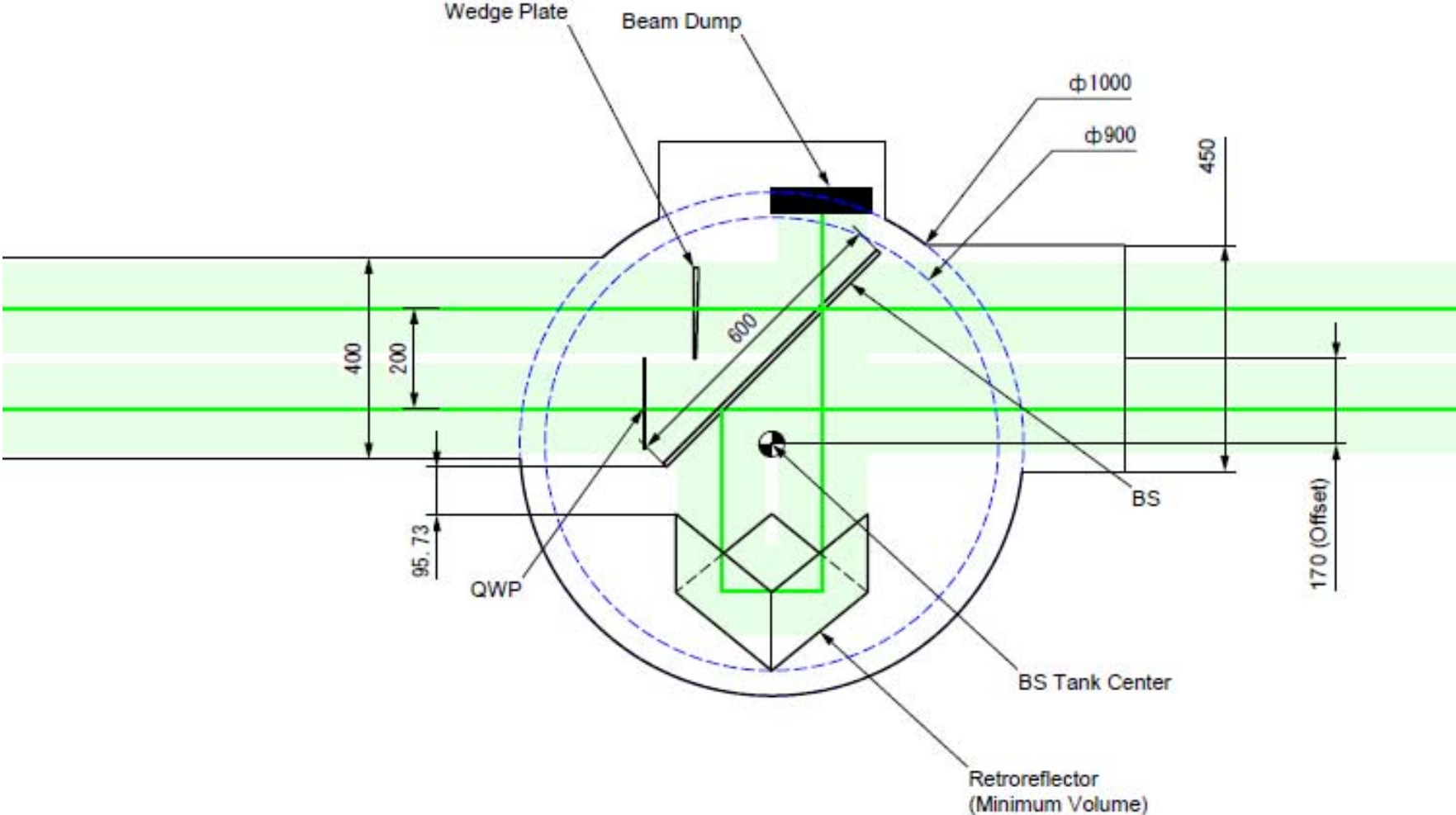
Hygrometers (laser)

Broadband seismometer (vault)

Accelerometer (laser, chamber)



Layout of center chamber



Schedule

2011.10-2013.3	Laser assemble (partially)
2011.10-2013.3	Optics assemble (partially)
2012.11-2013.3	Benchmark, vacuum installation (2nd tunnel)
2013.3-2013.7	Benchmark, vacuum installation (1st tunnel)
2013.4-2013.9	Laser and optics installation
2013.4-2013.9	Data acq. sys. Installation
2013.10-2014.3	Observation

Budget

FY2011			89.1Myen
Laser	@ 10Myen	x3	30Myen
Retro mirror	@ 10M	x4	40M
Optics	@	x2	
FY2012			792.0M
Chamber	@	x4	
Duct	@	x(3~5)km	
Vac. pump	@	x10	
Vac. misc.	@	x4	
Benchmark	@	x30	
Data acq.	@	x1	