

# Construction status and plan-1

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# Construction Status

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- Tunnel Excavation
  - Constructor decided, Groundbreaking ceremony (Jan.20, 2012).
  - Excavation start from December 2011.
- Vacuum system
  - ~400 Main Vacuum Duct ( $\Phi$ 800mm, 12m, total 478) delivered.
  - To be delivered soon (March 2012)
    - Gate Valve (Large 7, Small 120), 300 Metal O-rings,
    - 56 Ducts with pump port.
- Other Subsystems
  - Vibration Isolation : SAS parts delivered and in test.
  - Cryo system : Cryo-cooler first article in test.
  - Digital System : Several stand-alone system for subsystems.

# Impact of Tohoku Earthquake

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- Excavation was delayed by 1 year.
- Construction materials and resources are allocated for the recovery of the Tohoku area with the highest priority, our cost increased and the schedule is constrained.
- The public bid was held on Dec. 9<sup>th</sup>, 2011.
- The chosen constructor, Kajima Co., selected NATM for this tunnel (as pointed out by PAB).
- Associate Prof., to be appointed soon, will take the responsibility of safety issues and underground facility maintenance.

# Realizing large underground experiment spaces

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- We patiently negotiated with the constructors to keep the center and end experiment areas as large as possible.
- As a result, we could make the size of the experiment spaces tripled by spending only 0.1BYen additional cost for the 3BYen total excavation budget.

# Expenditure of KAGRA 1

(M Yen)

	2010	2011 first half	2011 last half	2012 -	total
Optics & Mirror	31	2	59	300	392
Vacuum	26	1598	1599	2400	5623
Laser	11	66	16	50	143
Suspension & Cryogenics	74	10	698	700	1482
Vibration Isolation	0	4	116	100	220
Geophysics Interferometer	24	326	14	250	614
Digital System	20	0	30	200	250
others	8	70	100	138	316
infrastructure				760	760
total	194	2076	2632	4898	9800

We arrange the budget allocation with our utmost effort to realize the KAGRA project under very limited budget and severely tight and tortuous subsystem schedules.

# Expenditure of KAGRA 2

(M Yen)

	2011	2012	2013	2014	2015	2016	total
Excavation	1,700	1,640					3,340
infrastructure			405	323			728
cryogenics			40	320	574	398	1,332
Total	1,700	1,640	445	643	574	398	5,400