Introduction and Meeting Goals

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Open Hyper-K meeting, June-21-2013
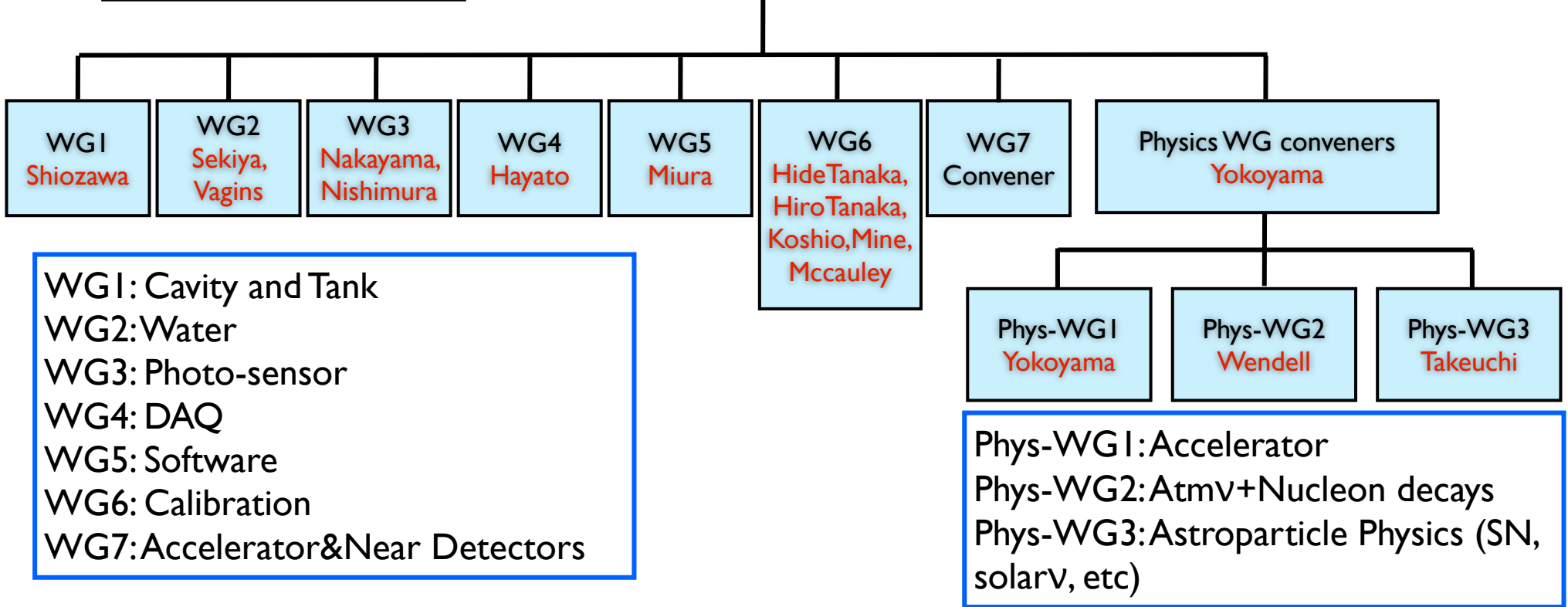
Hyper-K Working Group Organization

- oversee the HK group
- channel for contacting to the group
- involve non-Japanese in future

•want more conveners from abroad.
•may need a better organization (Task force?) to define a optimal detector design.

Steering Committee
Nakaya (chair)
Aihara, Nakahata,
Shiozawa, Yokoyama
+ a few more

Project Leader
Shiozawa

- PL oversees the sub-WGs
- WG conveners may be composed of one Japanese plus some non-Japanese.

WG1
Shiozawa

WG2
Sekiya,
Vagins

WG3
Nakayama,
Nishimura

WG4
Hayato

WG5
Miura

WG6
HideTanaka,
HiroTanaka,
Koshio, Mine,
Mccauley

WG7
Convener

Physics WG conveners
Yokoyama

WG1: Cavity and Tank
WG2: Water
WG3: Photo-sensor
WG4: DAQ
WG5: Software
WG6: Calibration
WG7: Accelerator&Near Detectors

Phys-WG1
Yokoyama

Phys-WG2
Wendell

Phys-WG3
Takeuchi

Phys-WG1: Accelerator
Phys-WG2: Atmν+Nucleon decays
Phys-WG3: Astroparticle Physics (SN, solarν, etc)

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*assuming budget being approved from JPY2016

Construction start

JFY2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
-4	-3	-2	-1	1	2	3	4	5	6	7	8	9

access tunnels, waste rock tunnels

cavity excavation

concrete, liner

PMT support, PMT installation

photo-sensor R&D

preparation for glass valve, PMT production

PMT production

water filling

Operation

- Need to define an optimal design (~0.5 year timescale).
- Need to write Technical Design Report (0.5~1 year).
- Need to revise cost estimation for the updated detector design.

13年6月21日金曜日

Detector Design

- Make efforts to reduce cost (but maximize physics)

    - Less segmentation walls.

    - Reduce the number of sensors w/ high QE.

    - Lighter support structure in the case of deploying electronics under water.

- We want to strengthen the astroparticle physics

    - Deeper site?

    - How much dark hits are tolerable? Sensors under development and # of sensors/compartment are OK?

    - Need (high density?) compartments?

    - Guideline by physics sensitivity study is necessary.

13年6月21日金曜日

Detector Design (2)

- Tochibora or Mozumi

  - Initial checks of rock class population and fault size in this summer. Hoping to observe better rock quality than Tochibora.

  - Higher cost for waste rock disposal. Details will be estimated after confirming the initial geological survey results.

- Requirements to the beam-line, and near detector system.

  - Design and cost estimation are necessary.

•Full detector simulation w/ HK geometry is necessary.
•Astroparticle is key to optimize the design (site, sensor, segmentation wall etc)
• Discussion should involve other physics targets.

13年6月21日金曜日

Which detector geometry should be simulated?

	LoI	Example
Compartments#	10x2	3x2
Photo-Detector	R3600(Super-K)	HQE B&L PMT
Photo-Det# (20 compartment case)	99,000 (99,000)	58000* (64500)

*Assuming that we don't need high density compartments.
*Assuming the effective photo-coverage is same with LoI.
　　20%(area coverage) x 22%(Q.E.) x 80%(C.E.)   (LoI)
　　　　~=13%(area) x 30%(Q.E.) x 90%(C.E.)   (Example)

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# Which detector geometry should be simulated?

Question:
- Which geometry should be studied? Efficient strategy?
- When HK simulation/reconstruction are ready?
- Requirements/Optimization for astroparticle physics?
- What should be studied for other physics targets?
- What is the timescale for the studies?

Need to compile inputs from software, physics, photo-detector, DAQ, and other groups.
- Discussions in your session are very welcome.
- We will re-visit this at the end of tomorrow.

13年6月21日金曜日

Initial survey at Mozumi site

13年6月21日金曜日
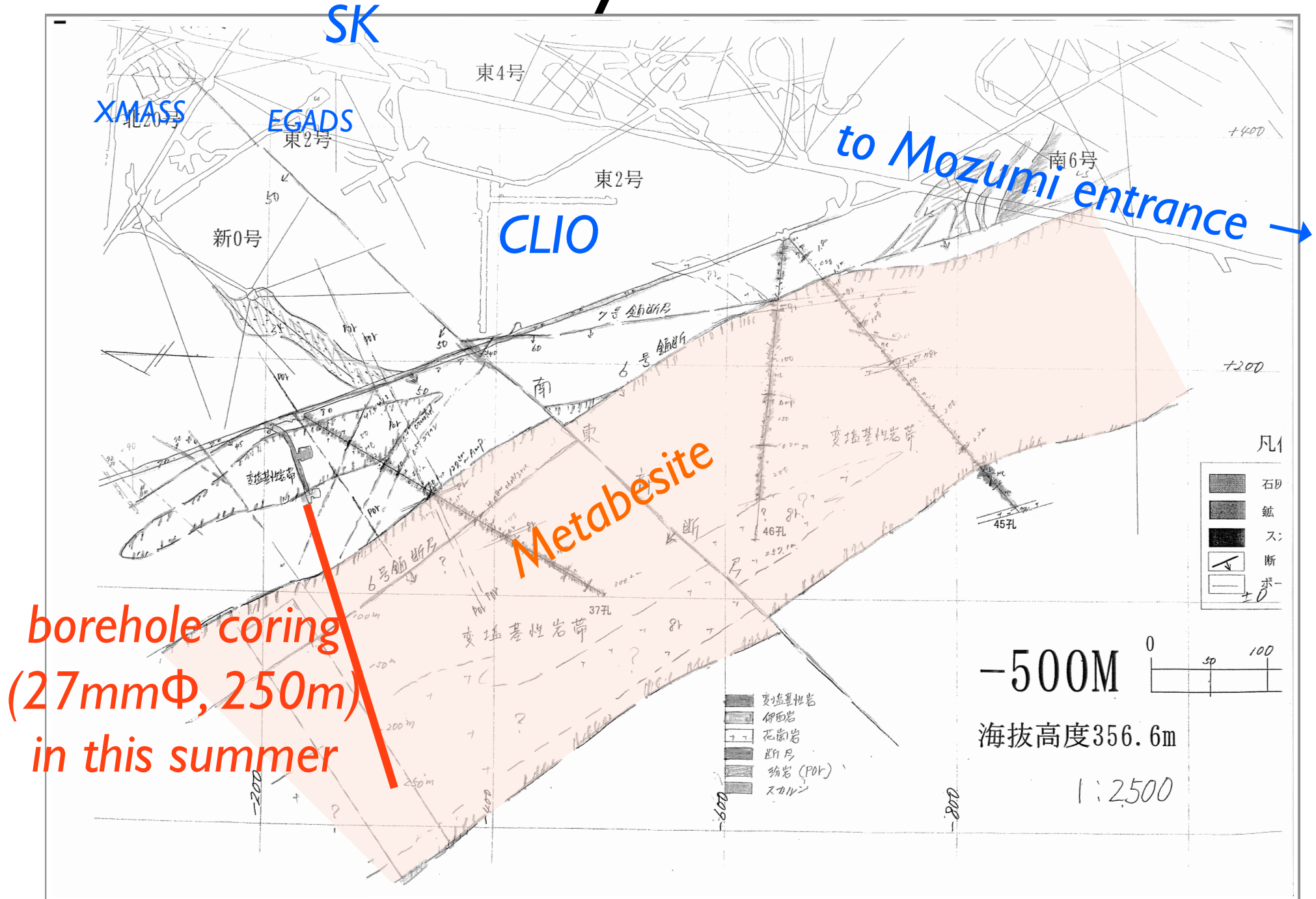
Budget request

- Submitted a proposal of R&D to Grant-in-Aid ($2.3M/5year).

- Prototypical Detector
  - ~1kton ($10 \times 10 \times 10 m^3$)
  - Feasibility test of
    - Liners
    - Leak water collection (drain), detection
    - photo-sensor support structure
    - DAQ system
    - Calibration system
- Including development of Water system, Photo-sensor, Electronics, Calibration system, Software …
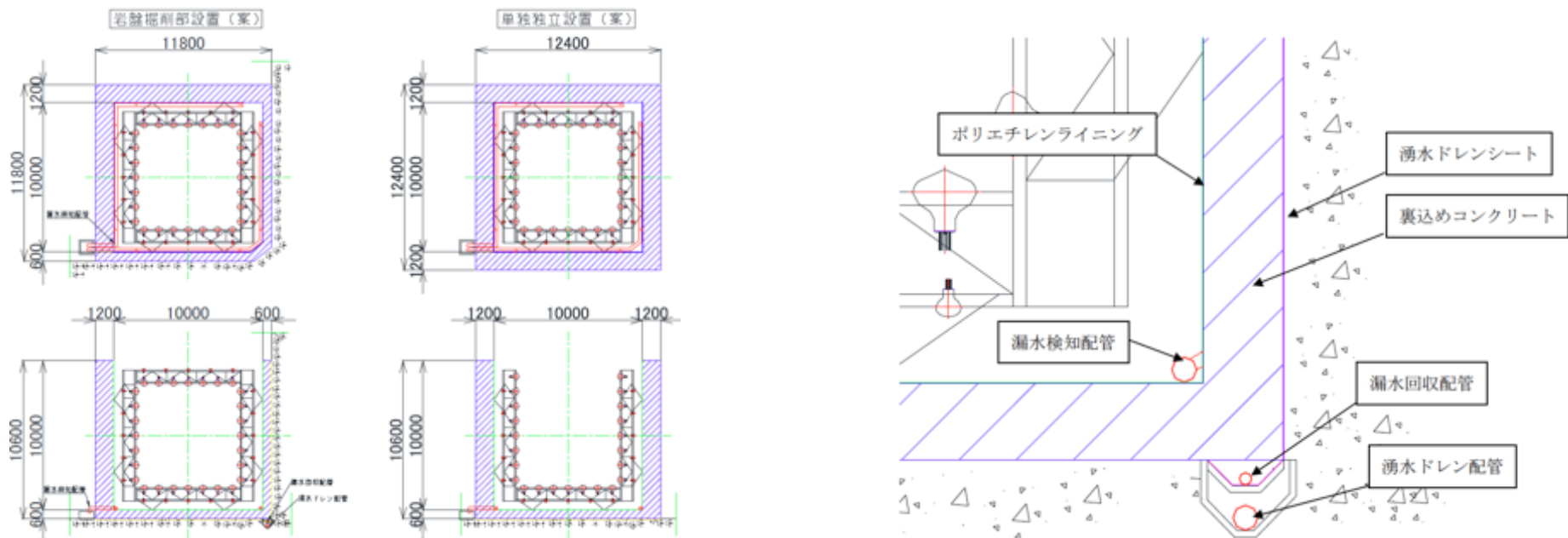
Conclusion

- Contributions from all of the sub-groups are necessary to achieve optimal detector design and beam/near detector upgrade plan.

- Provide your inputs on designs and its study plan.

- Let's have another fruitful meeting.

13年6月21日金曜日