

大型低温重力波望遠鏡KAGRA :全体報告

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日本天文学会 2014年春季年会 於国際基督教大学

KAGRA Collaboration in the world

- Research organizations of laboratories and universities are 28 in Japan and 36 in overseas
- 155 researchers in Japan and 76 in abroad, 231 members in total



Kamioka site

KAGRA is located in Kamioka mine.

- 220km away from Tokyo
- 360m altitude
- 200~300m underground
- Hard rock of 5km/s in sound speed





KAGRA Science



- Scientific objective
 - Direct detection of GW in one year observation
 - Opening GW astronomy
 World wide network
 Collaboration with other projects

Establishing high sensitive GW detector is needed to catch events occurring in more than 100Mpc.

Ultimate design sensitivity of KAGRA

This sensitivity achieves 167 Mpc for coalescence GW of 1.4 Ms NSB.

Duty factor: > 80% Expected event rate

Interferometer configuration

From iKAGRA to bKAGRA

Tunnel Excavation

Production and Test of SAS

19 standard GAS filters have been built and delivered.

Production of 6 top filters have been finished. Additional 2 top filters will be completed soon.

Production of inverted pendulums with NIKHEF is planed.

The test of payload prtotype is going in NAOJ.

Full prototype test will be started in TAMA.

Cryostat and Cryo-payload

Assembly and performance test of cryostats were finiched in the TOSHIBA Keihin Product Operations.

We are discussing sapphire mirror suspended by cradle with sapphire spring.

We started tests of CuBe blade spring for vertical isolation.

1.8mm-dia Photoran sapphire rod

M1.8 by Shinkosha

Core optics

Flat Mirror: < 1 Årms

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Schedule

Summary

- KAGRA construction is under way. The tunnel excavation was almost finished.
- KAGRA is promoted by UT under collaboration with KEK and NAOJ.
- First milestone of KAGRA is the operational run in 2015.
- bKAGRA operation starts in 2017.
- Observation in the world network since 2018.