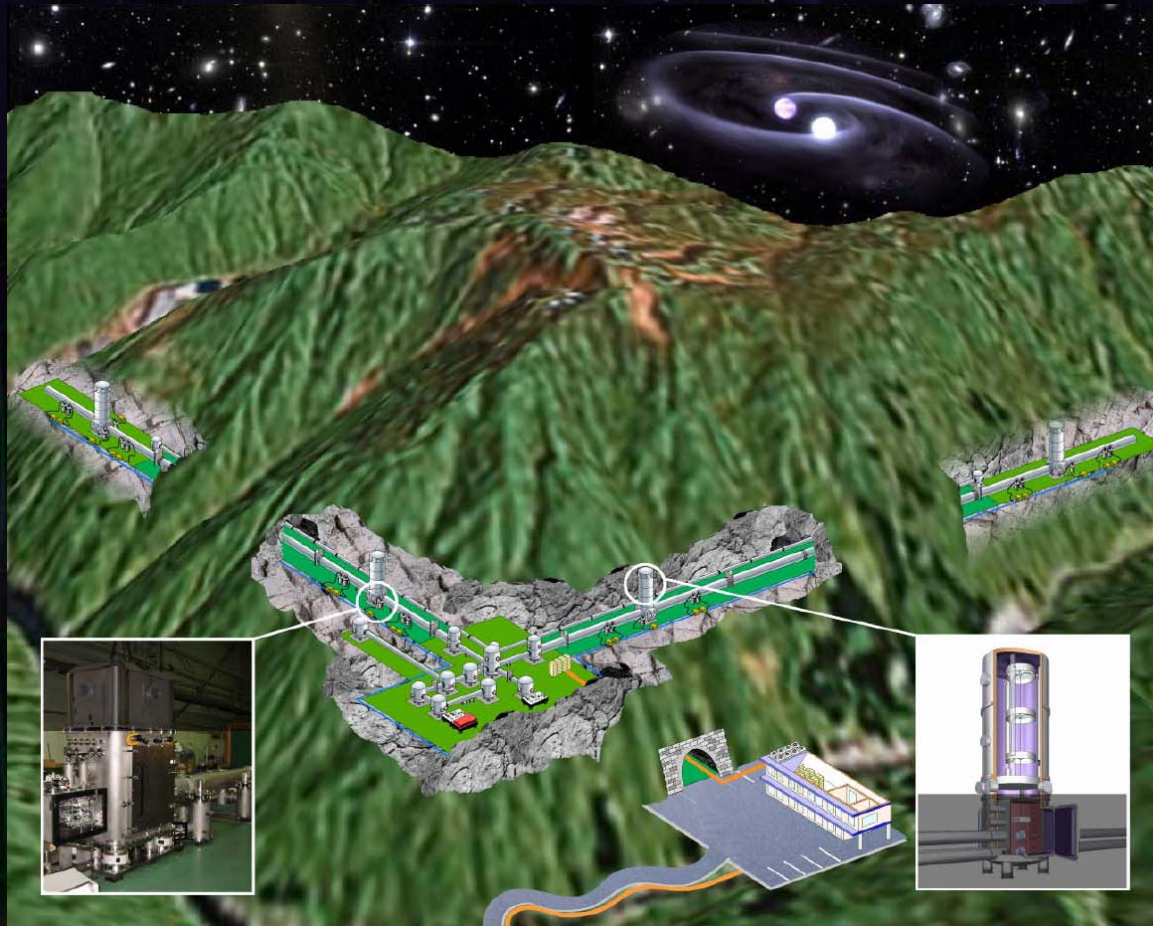


Special working group for LCGT RSE roadmap



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On behalf of LCGT RSE
special working group

LCGT RSE Roadmap Special working group

Original Scope

To recommend the roadmap to realize RSE in LCGT, including design, research, development, installation, and shakedown procedures.

Meetings

1st 2010 4/21 (Wed) 17:00-19:00

2nd 2010 5/12 (Wed) 17:00-19:00

3rd 2010 6/2 (Wed) 17:00-19:40

4th 2010 6/16 (Wed) 9:00-10:30

(Interim report in LCGT F2F)

5th 2010 7/21 (Wed) 17:00-19:00

Final Report Submitted on 2010 8/4

Basic Policy in LCGT

LCGT is an observatory, not an R&D instrument.
Performance of each component should be tested before its installation to LCGT.

「LCGTの推進について：基本的な考え方」

梶田先生 (2009.11.30)

•基本方針1: LCGTをR&Dマシンとはしない。

これはあくまで観測のマシンであるので、R&Dは例えばCLIOなどで行う。
R&Dの結果十分LCGTに入れて効果で出ると分かったもののみを入れる。

•基本方針1.5: 上記基本方針1は8年目からの運転についてもあてはめる。

十分なR&D成果が出ているもののみ入れる。つまり、full LCGTに入れる
となっても、R&Dの成果が十分でなければいけない。

•基本方針2:

上記を踏まえて、LCGT, CLIO, ...を用いた8年目当初までのロードマップ
を作成する必要あり。

Recommendation

- (1) RSE is a well-developed technique. We do not require a prototype with high sensitivity. Everything necessary for an RSE operation in LCGT should be ready until September 2014. We should concentrate on the design and test of LCGT itself, rather than spending efforts to construct a new prototype.
- (2) The roadmap to realize LCGT should be discussed and summarized in a newly-organized special working group. Design and techniques for RSE and related systems should be investigated in corresponding sub-working groups.
- (3) This special working group finishes its task.

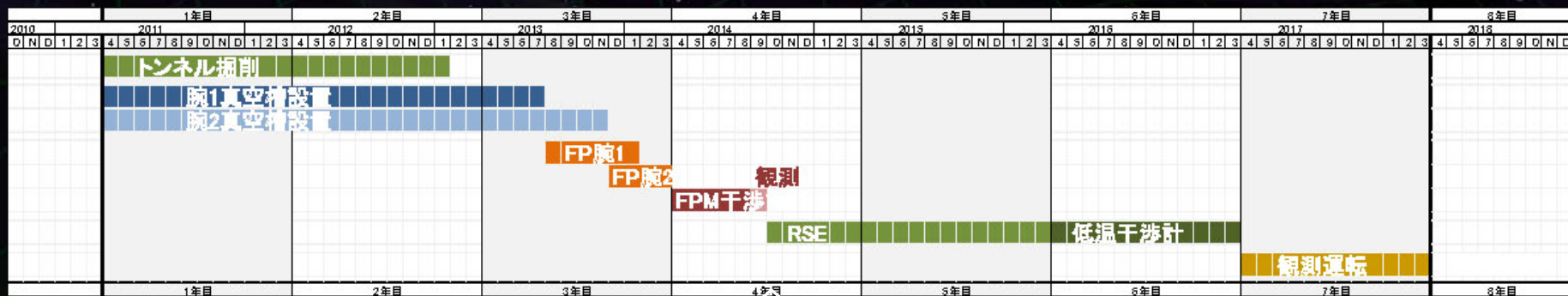
Some details

- The criteria of readiness of the RSE technique
 - Stable operation with prototypes.
 - Verification of the change in the response of an interferometer to differential arm motion (corresponding to GW signal).



Already satisfied with prototypes (NAOJ 4m, Caltech 40m)

- Installation of RSE will be just after iLCGT.



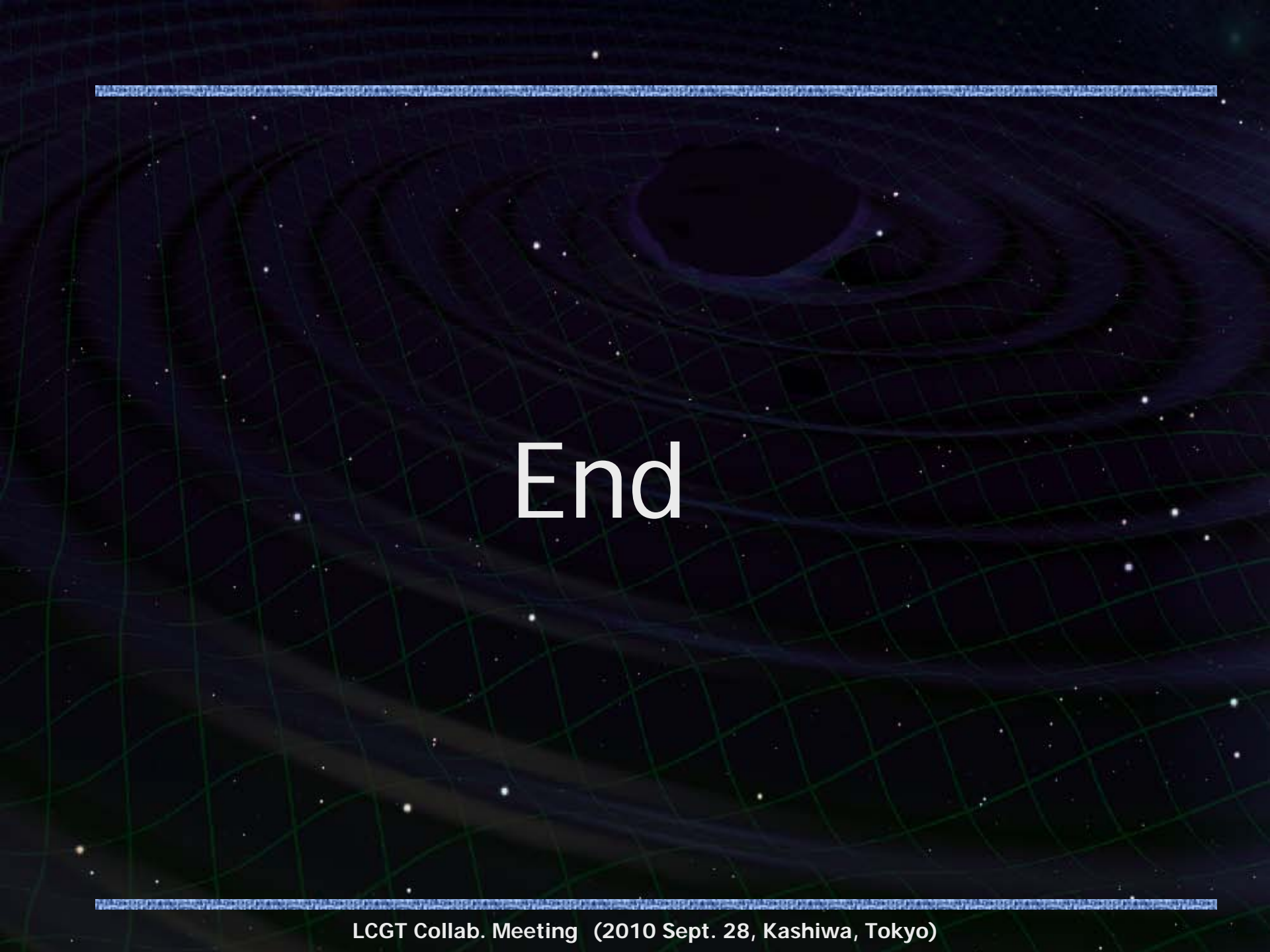
Preparation of installation of RSE should be ready by Sept. 2014

Important discussions

- (1) The schedule at LCGT is be extremely tight. Moreover the working environment at LCGT underground site is not good. Therefore we should be ready for the efficient installation and shakedown at the site; we should spent much efforts on design, tests, and scheduling of each components before its installation.
- (2) Commissioning procedure. In addition to the sensitivity, stability of the interferometer operation is important for GW detector. We should construct the interferometer step-by-step, such as one-arm operation, two-arm operation, recombined (iLCGT), RSE. We should clearly define the success criteria at each step, especially on sensitivity, stability and amount of observaton data.

Important discussions (contd.)

- (3) Installation procedure of the recycling mirrors.
RES will be installed just after iLCGT. Two additional mirrors (power-recycling and signal-extraction mirrors) should be installed at the same time. For convenience of shakedown, we should seriously prepare the bypass setup for the power recycling mirror.
- (4) Importance of an international collaboration.
Although sufficient technical feasibility has already been accomplished for RSE, an international collaboration is highly required for certain success of LCGT.



End