

**Attachment-C**  
**between**  
**KAGRA and Virgo Collaborations**  
**Agreement for joint technical collaboration**

Attachment-C to the Memorandum of Understanding (MOU) between the LIGO Scientific Collaboration, KAGRA and Virgo Collaborations establishes policies and procedures for joint technical collaboration between KAGRA and Virgo during the design, construction and commissioning phase of KAGRA and Advanced Virgo. It is anticipated that the joint technical collaboration will continue in the operations phase through renewing and updating this MOU /attachment.

A separate Attachment-B defines the collaborative data sharing and data analysis policies and procedures between the KAGRA, LIGO and Virgo scientific collaborations prior to scientific data taking. It anticipates policies by which KAGRA will become part of the global network with full data sharing.

This MOU /attachment defines the purpose, scope and collaboration policies for joint technical work on the design, construction and commissioning of KAGRA and Advanced Virgo. It anticipates continued technical collaboration when scientific data taking begins through a renewed and updated agreement.

By signing this attachment, both parties agree that they understand the nature of the collaborative work, consider it to be technically and scientifically worthwhile, and will do their best to bring it to successful completion.

**A. Description of Planned Collaborative Work**

The goal of the collaborative work defined in this MOU /attachment is primarily aimed at enabling Virgo and KAGRA members to collaborate on technical work during the design, construction and commissioning phase of KAGRA and Advanced Virgo.

We anticipate continued technical collaboration through a renewal of this attachment with appropriate updates even after commissioning.

The purpose of this collaborative agreement is for KAGRA and Virgo to work jointly on problems of common interest, or to benefit from the technical work and expertise already achieved by the other group. Both parties agree that this agreement will favor better and faster design, construction and commissioning of the respective instruments.

Such technical collaboration can take two forms:

1) People: Virgo members collaborating on the design, installation and commissioning of the KAGRA detector, and the reverse (KAGRA members collaborating on Advanced Virgo design, installation and commissioning);

2) Products: Specific technical tasks, exchanged instruments or responsibilities agreed between Virgo and KAGRA

This document addresses collaborative work in both forms.

Collaboration agreements will be proposed by the interested groups to both leaderships for approval, specifying the subject, duration and participants.

For item 2), collaborative tasks involving KAGRA or Virgo groups' technical expertise, technical staff or other resources like financial or in kind contributions are likely to need an agreement between funding institutions. Such agreements between laboratories will be defined in separate statements of work attached to the existing ICRR / EGO-Virgo MOU.

Publications, conference contributions and presentations resulting from these agreements will follow the rules established by the respective Collaborations. In particular, the Editorial Boards of the Collaborations should be informed sufficiently in advance for the evaluation of contents and of the author lists.

Collaboration agreements under this MOU/attachment could include consulting and building of equipment for KAGRA or Virgo under the following guidelines:

Each party may share technologies developed at the request of the other party. If the developing party agrees with such sharing, any costs of such sharing will be assumed borne by the requesting party. Agreement to share will be on a case-by-case basis and approved by the key personnel for each party. Each instance will be initiated by a request letter and confirmed by an acceptance letter from the respective collaboration leadership. It is agreed that the software and technologies developed by each party, or in collaboration, cannot be transferred to third parties outside of the collaboration without the prior written agreement of the developing party.

#### **B. Appropriate Use of Technical Information, Data and Other Information**

1. All parties agree that any technical information, data or data products received from the other parties shall be used only for the purposes of the collaborative work covered by this agreement, and shall be held confidential (unless already made public by the originating party).

2. Mutual access to collaboration web sites and/or mailing lists may be granted to facilitate collegial work. Any information exchanged related to this MOU /attachment C concerning KAGRA and Virgo should be treated as confidential unless it has already been made public.

Senior scientists of each group should ensure that all involved persons, including students and technical staff, understand and respect the sensitive nature of the data and information exchanged.

3. The parties acknowledge that any project results (which shall include discoveries, inventions, materials, intellectual property, know-how) developed under the collaboration described in this MOU /attachment C shall belong to the party developing them. Each party hereby provides the other party with a non-exclusive license to use these project results uniquely for internal, non commercial research and for the purposes of the collaboration. The project results must not be shared or transferred to third parties outside of the collaboration without the prior written agreement of the developing party.

Publication and publicity for results should meet Virgo and KAGRA policies wherever appropriate. The parties will ensure that, wherever practicable, all publications or other outputs from or related to work performed under the collaboration described in this MOU /attachment shall acknowledge the contributions of each party and their funding sources.

4. Individual Virgo members collaborating on KAGRA can collaborate individually on technical problems and perform the work at the condition that they abide by the rules of both collaborations. In particular, sharing technical information and documents will follow the same rules as established in the general policies of both KAGRA and Virgo. The aim of the joint technical collaboration is to enable forming direct collaborations on technical work and/or sharing of information to the benefit of both KAGRA and Virgo. At the same time, individual innovations, ideas and results that have been discussed within the joint technical collaboration, but have not yet been published, patented or made public, have to be protected.

### **C. Scope and Timeline**

1. This MOU /attachment concerns joint Virgo and KAGRA technical collaboration during the design, construction and commissioning phase of KAGRA and Advanced Virgo.
2. Exchange of technical information and participation of individuals during the time period of this MOU /attachment is encouraged — within commitments of the Collaborations — and will be carried out under the policies stated in this agreement.
3. Scientific presentations and publications resulting from the work under this agreement will follow the normal oversight and approval mechanisms established in both KAGRA and Virgo.

### **D. Term of the agreement:**

This agreement will come into effect beginning at the signing date, and lasting three years from that date. It may be automatically extended by mutual agreement between KAGRA and Virgo.

Signed by,

Takaaki Kajita, KAGRA PI (Principal Investigator)

Date 25/08/2016



Fulvio Ricci, Virgo Spokesperson

Date 25/08/2016

