

**Memorandum of Agreement
between the Virgo collaboration
and the INFN-Genova group
for the participation to Virgo**

April 1, 2015

The purpose of this agreement is to describe the participation of the INFN-Genova group to the Virgo collaboration. The period covered by this Memorandum is two years from the approval date of the VSC.

This is an update of the previous MoA for the Genova group (VIR-033A-07).

1. CNRS and INFN signed an agreement concerning the realization of an antenna, VIRGO, for the detection of gravitational waves on 27 June 1994 in Pisa. VIRGO consists of a three kilometres Fabry-Perot interferometric antenna aimed at the detection of gravitational waves in the frequency range 10-10000 Hz. The construction, exploitation and data analysis of the VIRGO antenna is under the responsibility of the Virgo collaboration, which has been defined in its present form in December 2001. The VIRGO collaboration is represented by its Spokesperson. The operation of the VIRGO antenna is supervised by the EGO Council.
2. The Initial propositions of the Genova group are described in the first MoA (see VIR-017A-07).
3. The Genova group responsibilities in the framework of the Advanced Virgo project are the following:
 - Responsibility of the design, realization, installation and commissioning of the Liquid Nitrogen distribution plant for the operation of the cryotrap (AdV-VAC)
 - Study of the electromagnetic coupling to the AdV payloads – simulations and experimental assessment (AdV-PAY)
 - Development of software for the superattenuator control electronics (AdV-SAT) and in framework of the VDASC group
 - Development of a lock acquisition scheme for the Advanced Virgo optical configuration(s) (AdV-ISC)
 - Participation in the AdV commissioning team (AdV-ISC)
 - Contribution to the design of the baffles for stray light mitigation (AdV-SLC)
 - Participation in the EM follow-up programme, through the development of combined data analysis strategies for the improvement of sky localization of transient sources. Development of machine learning techniques for the analysis and classification of astronomical and gravitational data.

Remark: the group will provide adequate support for the proper operation and maintenance of the devices under its responsibility.

4. The Genova group contributions to R&D for Advanced Virgo and beyond are the following:

- Structural and optical characterization of amorphous and nanometer-layered glassy oxide composites as advanced materials for reduced thermal noise in optical coatings. Investigation of possible extension to cryogenic operation.
- Development of software tools for simulation of quantum fields in complex optical systems using the two-photon formalism, finalized at the design of optical cavities for the realization of ponderomotive squeezing in advanced interferometers.

5. The current Genova group composition is:

| Name | FTE | Author | Student | Main activities |
|-------------------|-----|-----------------------------|---------|--|
| Diego Bersanetti | 1.0 | yes | PhD | AdV-ISC (100%) |
| Davide Bondi | 0.5 | no | no | AdV-VAC (50%) |
| Corrado Boragno | 0.3 | no | no | R&D coating (30%) |
| Fabio Bragazzi | 0.3 | no | no | AdV-SLC (30%) |
| Maurizio Canepa | 0.3 | no | no | R&D coating (30%) |
| Andrea Chincarini | 0.4 | yes | no | AdV-PAY (20%) Data analysis (20%) |
| Stefania Farinon | 0.4 | yes | no | AdV-PAY (40%) |
| Gianluca Gemme | 1.0 | yes | no | Group Leader - Management (70%) AdV-VAC (20%) R&D coating (10%) |
| Mauro Giovannini | 0.3 | no | no | R&D coating (30%) |
| Martina Neri | 1.0 | yes | PhD | AdV-PAY (80%) R&D coating (20%) |
| Luca Rei | 1.0 | yes | no | Software (AdV- SAT&VDASC) (40%) Data analysis (40%) R&D squeezing (20%) |
| Fiodor Sorrentino | 0.5 | yes* *from 01/08/2015 | No | AdV-ISC (50%) |

Remarks:

- In the activity section, specify the leading activity in each of the four main categories: Virgo operations (V), Advanced Virgo (AdV) and Data Analysis (DA). Indicate the FTE for each category. In case of an activity that cover several topics (like group leader), put it under Virgo operation.
- For a person who just joined the collaboration, the date in the author column is the date when the person will be added in the author list. This date is one year after the joining of the collaboration (except for student where there is no delay)

The Genova group leader will inform the collaboration of any change in the group composition and of any new thesis proposed.

Approved:

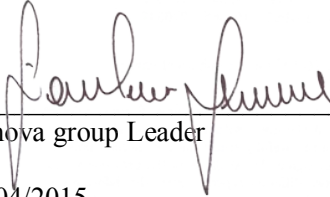


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Virgo collaboration Spokesperson

01/04/2015

Date



Genova group Leader

01/04/2015

Date