Memorandum of Agreement
between the Virgo collaboration
and the Firenze/Urbino group
for the participation to Virgo

Aprile, 2015

The purpose of this agreement is to describe the participation of the Firenze/Urbino group to the Virgo collaboration. The period covered by this Memorandum is two year from the date of the VSC approval.

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 kilometers 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 past involvements of the Firenze/Urbino group are described in the previous MoA (see documents in the Technical Documentation System).
3. The current Firenze/Urbino group responsibilities in Virgo are the following:
    - Management of the AdV project (G. Losurdo)
    - Production, optimization and full characterization of the monolithic fused silica fibres for AdV (responsible: F. Piergiovanni);
    - Development and maintenance of the time-domain simulation software (siesta) (responsible: A. Viceré);
    - Development and maintenance of the library of templates for binary searches (inspiral) (responsible: A. Viceré);

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

4. The current Firenze/Urbino contributions to Virgo working groups are the following:

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• AdV project leader (G.Losurdo).
• Participation in the CBC data analysis and in the development of CBC pipelines, particularly for the MBTA pipeline (G.M.Guidi, F.Piergiovanni).
• Chairmanship of the LSC-Virgo CBC search group (G.M.Guidi).
• Participation in the AdV-PAY subsystem, in the monolithic suspensions group (F.Martelli, M.Montani, F.Piergiovanni, A.Viceré).
• Participation in AdV-OSD subsystem, particularly for the simulation of AdV cavities taking into account higher-order modes and scattering losses (J.Harms).
• Participation in R&D activities for the development of locking strategies based on modern control techniques (J.Harms, L.Cerboni Baiardi).
• Participation in R&D activities for the development of a squeezed light source (J.Harms, A.Viceré, F.Vetrano).
• Participation in noise analysis: study of linear and non-linear noise couplings among auxiliary channels and h(t) (F.Piergiovanni, G.M.Guidi).
• Participation in R&D activities for Newtonian noise subtraction, and more generally for low-frequency detector technologies (J.Harms).
• Participation in the preparatory phase and the infrastructure development for the EM follow-up program and the definition of the GW/EM observational strategy (M.Branchesi, G.Greco, G.Stratta).
• Liaison of the EM follow-up team (M.Branchesi).
• Participation in the EM MoU committee (M.Branchesi).
• Participation in the development of combined electromagnetic and gravitational wave data analysis strategies for transient sources (M.Branchesi, G.Greco, G.M.Guidi, F.Piergiovanni, G.Stratta).

5. The current Firenze/Urbino group composition is:

Name	FTE	Author	Student	Permanent	Activity and thesis argument if any
Marica Branchesi	1.0	Yes	No	No	DA (1.0): Multi-messenger (transversal CBC/Burst)
Lorenzo Cerboni Baiardi	0.5	01/11/2014	Yes	No	R&D (0.5): Development of locking schemes based on modern control methods
Giuseppe Greco	1.0	01/02/2015	No	No	DA (1.0): Multi-messenger (transversal CBC/Burst)
Gianluca M.Guidi	1.0	Yes	No	Yes	DA (1.0): CBC searches and pipeline development (0.6), Multi-messenger (0.2), Tools for detector characterization (0.2).
Jan Harms	0.6	01/05/2014	No	No	AdV-OSD (0.2): Study of AdV behaviour taking into account higher order modes; R&D (0.2): Development of locking schemes based on modern control methods; R&D (0.2): Newtonian noise subtraction, low-frequency detectors.
Giovanni Losurdo	1.0	Yes	No	Yes	AdV-MAN (1.0) Project Leader
Filippo Martelli	1.0	Yes	No	Yes	AdV-PAY (1.0) Silica fibres for monolithic suspensions
Matteo Montani	1.0	01/12/2014	No	No	AdV-PAY (1.0) Silica fibres for monolithic suspensions
Francesco Piergiovanni	1.0	Yes	No	Yes	AdV-PAY (0.4): Silica fibres for monolithic suspensions DA (0.6): CBC online searches and development (0.4), Multi-messenger (0.1), Tools for detector characterization (0.1)
Giulia Stratta	1.0	01/08/2015	No	No	DA (1.0): Multi-messenger (transversal CBC/Burst)
Flavio Vetrano	0.6	Yes	No	Yes	R&D (0.6): Development of squeezed light sources
Andrea Viceré	0.6	Yes	No	Yes	V (0.2): Group leader AdV-PAY (0.2): Silica fibres for monolithic suspensions R&D (0.2): Development of squeezed light sources

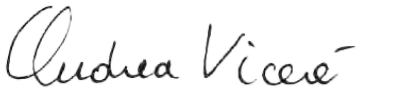
Remarks:

- In this MoA, for group members with teaching duties the given FTE numbers refer to the time dedicated to research.
- In the activity section, specify the leading activity in each of the four main categories: Virgo operations (V), Advanced Virgo (AdV), Data Analysis (DA) and Research & Development (R&D). Indicate the FTE for each category. In case of an activity that covers 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 joining the collaboration (except for students and postdocs who defended their PhD less than two years ago, for whom there is no delay)

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

Approved:

Virgo Collaboration Spokesperson



Firenze/Urbino Group Leader

Date 01/04/2015

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