

滞在型研究員報告書
Activity Report for the NAOJ Visiting Fellows Program

所 属 (Institution)	APC – Université Paris Diderot
氏 名 (Name)	Eleonora Capocasa
研究課題名 (Research subject)	Realization of a 300 m long filter cavity for the production of frequency-dependent squeezed states of light at TAMA
滞在期間 (Period of stay)	年 月 日 ~ 年 月 日 2015 11 07 2015 12 06
受入責任者氏名 (NAOJ host researcher)	Raffaele Flaminio

1. 滞在型研究員として国立天文台滞在中に行った活動について簡単にお書きください。
(Summarize your activities during the stay using the NAOJ Visiting Fellows Program.)

My activity has been carried out in the contest of the project for producing frequency-dependent squeezing to prepare the future upgrade of KAGRA.

I have worked in particular on the installation of the suspension system for the filter cavity mirror, needed for this purpose. I also took part in the design of the input telescope needed to inject frequency-independent squeezed light in the filter cavity.

2. 今回滞在型研究員として得られた成果について簡単にお書きください。
(Summarize your research products from the stay.)

The first part of my work concerned the installation of suspension system for the input mirror of the filter cavity. We replaced the SAS TAMA suspension in the vacuum chamber with a double pendulum placed on a multilayer stack (suspension system used in initial TAMA). We also developed an optical lever to measure the motion of the mirror and the stack. This sensor will provide an error signal used to control the mirror motion between 1 and 10 Hz.

In the second part of my work I helped in the design of the injection telescope studying the expected behavior of the beam and possible aberration effects. I also estimate the losses due to telescope mirror defects for different flatness specifications.

I presented the result of my work in the 4th ELITES meeting.

様式 2 (Form 2)

The results of my work are summarized in a note “Suspension system installation and input telescope design for the 300-m filter cavity in TAMA”.

Last but not least I finalized a paper about “Losses estimation in a 300-m filter cavity and quantum noise reduction in the KAGRA gravitational-wave detector” which describes the work that I did during my first stay at NAOJ and I submitted the paper to a journal.

3. この制度について何か御意見がありましたら、お書きください。

(Please provide any comments about this program.)

This has been my second experience with the Visiting Fellow Program and, as the first time, I found it to be very stimulating and well organized.