様式 2 (Form 2)

（2015 年 1 月改定）

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)	Losses estimation in a 300 m long filter cavity for the production of frequency-dependent squeezed states of light
滞在期間 (Period of stay)	年　月　日　～　年　月　日 2015　06　01　～　2015　07　03
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 context of the frequency-dependent squeezing production project foreseen in the near future at NAOJ to prepare the future upgrade of KAGRA.
I have worked in particular on the losses estimation for a high finesse filter cavity, needed for this purpose.
I performed optical simulations of the cavity using realistic mirror maps in order to give an estimation of the achievable optical losses.
I also studied mechanisms responsible for the squeezing degradation to quantify their effect on the system.

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.)

Using simulations, I could quantify the level of losses expected in a 300 m filter cavity using mirrors with different flatness. This allowed to set specific requirement on the mirror quality needed for the filter cavity to be installed in TAMA. I also quantify the level of squeezing achievable taking into account different degradation mechanisms, pointing out the effect of losses and the most critical parameters of the system.
I also gave an estimation of the expected improvement in KAGRA sensitivity achievable using frequency dependent squeezing.
I presented the result of my work in a seminar at the GWPO meeting.
The results of my work are summarized in a KAGRA note “Estimation of losses and squeezing degradation in a 300m filter cavity” that I’m finalizing.

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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.)
The Visiting Fellow Program was very well organized and gave me the possibility to better know NAOJ and work in a stimulating and pleasant environment. I found this experience extremely enriching and fruitful both on a scientific and personal level.