

Research Report

ICRR Inter-University Research Program 2019

Research Subject:

Development of offline calibration and reconstruction system for KAGRA observation

Principal Investigator:

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Participating Researchers:

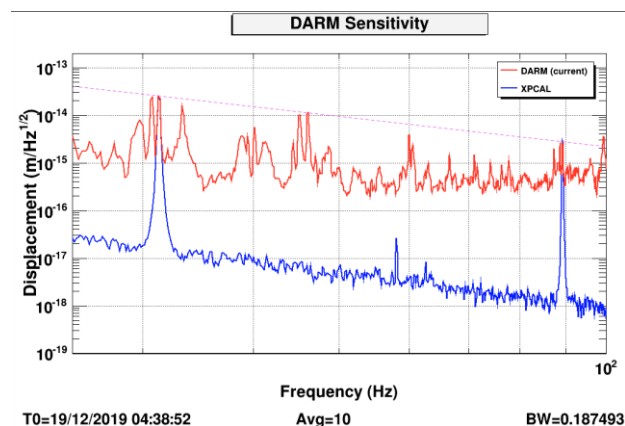
井上 優貴,澤田崇広,神田展行,土田怜,富上由基,山本尚弘,横澤孝章,鷲見貴生,苔山圭以子,大柿航,和泉究,鈴木敏一,牛場崇文,道村唯太,都丸隆行,田越秀行,三代木伸二,森脇喜紀,阿久津智忠,灰野禎一,Darkhan

Tuyenbayev, Yu-Kuang Chu, Harn-Fung Pang, Hsuan-Yu Chu

Summary of Research Result :

The great success of gravitational wave observations have given us the new vision for astronomical physics. The achievement of world-wide observation is expected to play a significant role for the measurements of parameters and un-known physics. In order to pursue the new physics with O3, we need to calibrate the absolute amplitude and phase of the waveform. We require calibration accuracies on the order of 10 % and 10 degree for future observing runs.

In FY 2019, we characterized the interferometer and took the data in engineering run. We calibrated the response of interferometer and reconstructed the gravitational waveform. By improving the calibration accuracy, we achieve to develop the photon calibration system. Figure shows the reconstructed $h(t)$ and prediction with photon calibrator signal. The prediction meets the reconstructed signals.



We also succeeded to provide the low-latency data. These achievements are important milestones of gravitational wave detector development.

We also developed the gravity field calibrator for the absolute calibration. With the collaboration of ICRR, KEK, and Taiwan, we will install the gravity field calibrator in the future