

## Research Report

### ICRR Inter-University Research Program 2020

Research Subject:

Filter cavity experiments for frequency dependent squeezed light source for KAGRA

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Summary of Research Result :

With ICRR and NAOJ, in this ICRR Inter-University Research Program 2020, entitled “Filter cavity experiments for frequency dependent squeezed light source for KAGRA,” we have demonstrated frequency dependent squeezer (FDSQZ) in NAOJ, see Zhao et al., Phys. Rev. Lett. 124, 171101 (2020). The target is to implement this FDSQZ to upgrade the sensitivity of KAGRA.

However, due to the Covid-19 pandemic, we could not conduct our research as initially planned. The travel to Japan is almost forbidden in the FY 2020. ICRR Inter-University Research Program's Committee has approved our request to carry over the research budget for the fiscal year 2021.

Nevertheless, a working group on the KAGRA Filter Cavity was formed, with regular biweekly online meeting on the implementation for KAGRA. On behalf of our collaboration team, Prof. Ray-Kuang Lee also gave a online report, entitled “Filter cavity experiments for Frequency Dependent Squeezed light source (with Machine Learning Quantum State Tomography) for KAGRA”, to the “research result presentation meeting” of the ICRR Inter-University Research Program held on February 8<sup>th</sup>-9<sup>th</sup>, 2021.

No.