

Quantum Information Seminar

Quantum non-Gaussianity and secure communication

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Date:

November 22, 2019

Friday

2:00-3:00pm

Venue:

Room 313

Chow Yei Ching Building

The University of Hong Kong

Abstract:

I introduce quantum non-Gaussianity in bosonic system. It is of crucial importance to identify quantum non-Gaussian states that cannot be produced by Gaussian resources and their statistical mixtures. A simple mixture of Gaussian states can be generated without quantum non-Gaussian operations and they are thus not suitable to perform quantum information tasks, which require genuinely quantum non-Gaussian resources. I propose a quantum non-Gaussianity measure, which is defined by a convex roof of quantum relative entropy, and investigate the properties of the measure. Further, I introduce the critical role played by their quantum non-Gaussianity in quantum communications, addressing communication security. I investigate the no-cloning bound of non-Gaussian states with unknown displacement. I show that the no-cloning bound decreases as non-Gaussianity increases, but it becomes harder to achieve the bound by quantum teleportation.

About the Speaker:

Jaehak Lee obtained his Ph.D (integrated course) in Feb 2012 at Department of Physics, Korea Institute of Science and Technology (KAIST) supervised by Hai-Woong Lee. Then he became a postdoctoral research associate at Texas A&M University at Qatar from Mar 2012 to Jun 2017, supervised by Hyunchul Nha. From Jul 2017 to Oct 2018, he worked as Assistant Research Scientist at Texas A&M University at Qatar. He has been a Research Associate at Korea Institute of Advanced Study (KIAS) since Nov 2018.

All are welcome!

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