CQSE Special Seminar

「Nov. 13, 2020 (Friday)」

- Time : 10:30~11:30
- Place : Rm716, New Physics Building
- Speaker: **Prof. Lianao Wu**

  Dept. of Theoretical Physics,
  University of Basque Country, Spain
- Title : One Component Quantum Mechanics and a Universal Leakage Elimination Operator

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and Center for Advanced Study in Theoretical Sciences (CASTS) 理論科學高等研究中心, NTU

Joint CQSE and CASTS Seminar

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November 13, Friday

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TITLE One Component Quantum Mechanics and a Universal Leakage Elimination Operator
SPEAKER Prof. Lianao Wu
Ikerbasque Professor, Department of Theoretical Physics, University of Basque Country UPV/EHU, Spain
PLACE Rm716, CCMS & New Physics Building, NTU

Abstract:

We use a Feshbach P-Q partitioning technique to derive a closed one- component integro-differential equation. The resultant equation properly traces the footprint of the target state in quantum control theory. The physical significance of the derived dynamical equation is illustrated by both general analysis and concrete examples. Leakage from an encoded subspace to the rest of the system space is a particularly serious problem for which leakage elimination operators (LEOs) were introduced. By using the resultant dynamical equation, we show that the effectiveness of LEOs depends on the integral of the pulse sequence in the time domain, which has been missing because of the idealization of pulse sequences. Our results are applied to a three- level system for the nitrogen-vacancy centers under an external magnetic field and are illustrated by the fidelity dynamics of LEO sequences, ranging from regular rectangular pulses, random pulses, and even disordered (noisy) pulses.

About the Speaker:

- Ikerbasque Professor in Department of Theoretical Physics and History of Science and Ikerbasque Foundation, The Basque Country University, Spain (October 2008 – present).
- Research Field(s): Quantum Control, Quantum Information Processing and devices
- Researcher and Research Associate in Center for Quantum Information & Quantum Control, University of Toronto, Canada (October 2000 – October 2008).
- Associate, Full Professor in Theoretical Physics, Department of Physics, Jilin University, Changchun, China (1992 – 1999).

- N O T I C E -

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