



香港浸會大學

HONG KONG BAPTIST UNIVERSITY

FACULTY OF SCIENCE

Department of Physics & Institute of Computational and Theoretical Studies

JOINT COLLOQUIUM

Exact Solvability and Non-integrability of the Dicke Model

BY

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4:00pm – 5:00pm (Tea will be served)

T909, Science Tower, HSH Campus

Abstract

In this talk, I will introduce extended coherent states approach in detail and demonstrate its successful applications to the finite size Dicke model [1,2], including the single-qubit Rabi model [3]. Both analytical and numerical exact solutions are given. For the $N=2k$ or $2k-1$ Dicke models (k is an integer), a well-defined transcendental function, which is only an energy dependent $k \times k$ determinant, is derived in a transparent manner. The regular spectrum is completely and uniquely given by stable zeros of this function. The closed-form exceptional eigenvalues are also derived. The level distribution controlled by the pole structure of this function suggests non-integrability for $N>1$ model at any finite coupling.

[1] arXiv:1404.7834; Revised in New Journal of Physics.

[2] Phys. Rev. A 78, 051801(R)(2008)

[3] Phys. Rev. A 86, 023822 (2012)

All Interested Are Welcome!