

## The 25th IOPP Seminar : 林树 (Shu Lin) 教授, 中山大学 (Sun Yat-sen University), Sept. 14, 2021, Tuesday, 10:00am (Beijing time)

Time : Sept. 14, 2021, Tuesday, 10:00am (Beijing time), Room 9409.

Speaker: 林树 (Shu Lin) 教授, 中山大学 (Sun Yat-sen University)

Title : Quantum kinetic theory for quantum electrodynamics

Abstract : In this talk, I will discuss recent effort toward deriving quantum kinetic theory for QED. By assuming parity invariance at the lowest order in  $\hbar$ , we find the classical limit of the kinetic theory generalizes the well-known classical kinetic theory to massive case including both elastic and inelastic collisions with screening effect. The resulting classical kinetic theory simplifies when fermion bare mass is much greater than screening mass. In this case only elastic collision is relevant and screening is only needed for Coulomb scattering. For a given solution to the classical kinetic theory, we find at  $O(\hbar)$  non-dynamical part of the quantum correction to Wigner functions for fermion and photon, which gives rise to spin polarization for fermion and photon respectively. Other contributions to spin polarizations from dynamical part of the correction to Wigner function are possible when parity violating sources are present.

报告人简介:

林树, 中山大学物理与天文学院教授, 博士生导师。2004 年本科毕业于北京大学; 2010 年博士毕业于美国纽约州立大学石溪分校。

2010-2012 年在慕尼黑马普物理研究所任博士后。2012-2015 年在美国布鲁克黑文国家实验室任博士后。2015 年加入中山大学。

研究兴趣包括: 规范引力对偶的场论应用、反常输运和量子输运以及重离子碰撞唯象。

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