SFB1242

SFB 1242 Nichtgleichgewichtsdynamik kondensierter Materie in der Zeitdomäne

UNIVERSITÄT DUISBURG ESSEN

Open-Minded

20.12.2022 / 10 Uhr c.t., Raum MG 272
Campus Duisburg

Hidden Information in Higher-Order Photon Statistics

Dr. Philipp Stegmann

Massachusetts Institute of Technology

The statistics of emitted photons yields detailed insight into the time evolution of quantum emitters. Seminal quantities measured in experiment and used to characterize the statistics are the $g^{(m)}$ correlation functions. Here, we show how to evaluate these correlation functions based on higher-order factorial cumulants, which integrate over the time dependence of the correlation functions, i.e., summarize the available information at different time spans. We analyze the photon emission of a plasmonic cavity coupled to a single quantum dot [1] and demonstrate how the presence of a hidden excited state can be verified despite limited counting efficiency and time resolution in experiment. Moreover, we show how the cumulants can be decomposed into separate contributions from the classical and quantum part of an emitter's time evolution [2,3]. We demonstrate how quantum corrections can be identified in different models of molecular aggregates.

[1] P. Stegmann, S. N. Gupta, G. Haran, and J. Cao, ACS Photonics 9, 2119 (2022).
[2] P.-Y. Yang and J. Cao, J. Phys. Chem 11, 7204 (2020).
[3] J. Wu and J. Cao, J. Chem. Phys. 139, 044102 (2013).

Für diese Zeit steht eine Kinderbetreuung nach vorheriger Anmeldung zur Verfügung.

Contact: Prof. Dr. Björn Sothmann, Faculty of Physics
Phone: +49 (203) 37-93330 / Mail: bjoerns@thp.uni-due.de