Graduate School Seminar

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SFB 652

24th November 2016, **15:15**

Martin Bohmann
Theoretical Quantum Optics

Quantum light in atmospheric channels

The development of secure quantum communication, based on quantum key distribution, is part of the rapidly growing field of quantum information science. In particular, quantum communication using atmospheric free-space links has the potential of establishing secure communication on a global scale. Due to recent efforts, such schemes come within reach of experimental implementations. For such cases, the quantum light suffers from fading effects, i.e., fluctuating losses due to the propagation in the turbulent atmosphere.
In this context, we first aim at studying the entanglement of two-mode Gaussian states in atmospheric channels. Various atmospheric conditions and stats are studied. One of our major findings is that the atmospheric turbulence introduces a nontrivial dependence of the entanglement test on coherent displacements, which can be used for information encoding. Further, we generalize this approach to higher order-moment criteria. This also includes the characterization of single-mode nonclassicality and multipartite entanglement in atmospheric channel.

Talk: English
Slides: English

Location: Institute of Physics, Albert-Einstein-Str. 24, HS1

Talks in WS 2016/2017

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