

TRR Guest Scientist Lecture / Seminar

Date/Time: 23.11.2016 / 2pm
Location: Paderborn, P8.4.09.

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Shaped single photons: generation, characterization and applications

Abstract:

Complete control over the properties of light up to the level of single photons is an invaluable tool for quantum information science and fundamental studies of light-matter interaction. The crucial prerequisite is the ability to create a spatio-temporal distribution of single-photon electromagnetic field with the desired characteristics, i.e. to shape a photon by design. In this talk, we discuss a novel generic method that enables lossless shaping of single photons with respect to any degree of freedom or several degrees of freedom simultaneously. Shaping is performed in a heralded manner, which ensures flexibility and scalability of the scheme. Our generic method can be directly integrated with current technologies. This enables the experimental realization of numerous proposals involving shaped single photons and opens up qualitatively new opportunities. As an example, we show an application of shaped photons for quantum communication.

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