



Universität
Basel

Research Project

LASERLOOP / Laser loop for engineering long-distance interactions in hybrid quantum systems

Third-party funded project

Project title LASERLOOP / Laser loop for engineering long-distance interactions in hybrid quantum systems

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Organisation / Research unit

Departement Physik / Experimentelle Nanophysik (Treutlein)

Department

Departement Physik

Project start 01.03.2021

Probable end 28.02.2023

Status Completed

Light is a powerful carrier of quantum information and an established tool to manipulate matter at the quantum level. In this action, we explore a novel technique of using light in quantum physics and technology: As a means to generate for the first time strong, quantum coherent interactions between different systems over macroscopic distances. Our approach relies on a laser loop that connects the systems and mediates coherent bidirectional interactions between them. This is possible due to a destructive interference of the quantum noise introduced by the light, otherwise responsible for decoherence. At the same time, information is erased from the output field, making the loop effectively closed to the environment. This makes it possible to achieve quantum coherent coupling between the systems.

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Specify cooperation partners