Universität Konstanz

SFB 767 Sonderseminar

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Microresonators for Quantum Optics

Microresonators are developing as promising platforms for quantum optics. A number of quantum applications of such resonators have been recently demonstrated, including entangled photon pair generation at microwatt-level pump powers, high-efficiency quantum frequency conversion, and strong coupling of photonic modes. These devices can also be used as sources of heralded single photons. By studying the theoretical underpinnings of these and other nonlinear optical processes in resonant microstructures using fully quantum-mechanical models [1-4], we aim to better understand what is and what is not possible in such systems, and to extend our findings to the general theory of cavity nonlinear optics.

[1] Z. Vernon and J.E. Sipe, Phys. Rev. A 91, 053802 (2015)
[2] Z. Vernon and J.E. Sipe, Phys. Rev. A 92, 033840 (2015)
[3] Z. Vernon, M. Liscidini, and J.E. Sipe, Opt. Lett 41, 788 (2016)
[4] Z. Vernon, M. Liscidini, and J.E. Sipe, Phys. Rev. A 94, 023810 (2016)

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