Tobias Herr
Alexander Ulanov, Thibault Wildi, Lenja Vollmer, Bastian Ruhnke
Deutsches Elektronen-Synchrotron DESY and Universität Hamburg, Hamburg, Germany

Controlling nonlinear processes in photonic crystal resonators

Chip-integrated microresonators are efficient platforms for nonlinear optics. In nano-corrugated microresonators, also known as photonic crystal resonators, resonator modes can be deliberately coupled with counterpropagating modes on a resonance-by-resonance basis. In this way, the resonator dispersion, nonlinear processes, and photon flows can be controlled. These capabilities create new opportunities for frequency comb generation (1, 2) and for novel quantum light sources (3).

References

[1] Ulanov et al., Nat. Phot. 18 (2024) 294-299
[2] Wildi et al., Nat. Comm. 15 (2024) 7030
[3] Ulanov et al., arXiv:2502.17337 (2025)