



# Bloch-wave engineering of quantum dot-micropillars for cavity quantum electrodynamics experiments

Matthias Lerner, Niels Gregersen, Florian Dunzer, Stephan Reitzenstein, Sven Höfling, Jesper Mørk, Lukas Worschech, Martin Kamp, Alfred Forchel

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We have employed Bloch-wave engineering to realize submicron diameter ultra-high quality factor GaAs/AlAs micropillars (MPs). The design features a tapered cavity in which the fundamental Bloch mode is subject to an adiabatic transition to match the Bragg mirror Bloch mode. The resulting reduced scattering loss leads to record-high visibility of the strong coupling in MPs with modest oscillator strength quantum dots. A quality factor of 13,600 and a Rabi splitting of 85  $\mu\text{eV}$  with an estimated visibility  $v$  of 0.38 are observed for a small mode volume MP with a diameter  $d_c$  of 850 nm.

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