Extraction of the beta-factor for single quantum dots coupled to a photonic crystal waveguide - DTU Orbit (02/01/2019)

We present measurements of the β-factor, describing the coupling efficiency of light emitted by single InAs/GaAs semiconductor quantum dots into a photonic crystal waveguide mode. The β-factor is evaluated by means of time resolved frequency-dependent photoluminescence spectroscopy. The emission wavelength of single quantum dots is temperature tuned across the band edge of a photonic crystal waveguide and the spontaneous emission rate is recorded. Decay rates up to 5.7 ns⁻¹, corresponding to a Purcell factor of 5.2, are measured and β-factors up to 85% are extracted. These results prove the potential of photonic crystal waveguides in the realization of on-chip single-photon sources.

General information
State: Published
Organisations: Quantum Photonics, Department of Photonics Engineering
Contributors: Nielsen, H. T., Sapienza, L., Lodahl, P.
Pages: 231106
Publication date: 2010
Peer-reviewed: Yes

Publication information
Volume: 96
Issue number: 23
ISSN (Print): 0003-6951
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 3.25 SJR 1.382 SNIP 1.167
Web of Science (2017): Impact factor 3.495
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.67 SJR 1.673 SNIP 1.249
Web of Science (2016): Impact factor 3.411
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 2.47 SJR 1.499 SNIP 1.226
Web of Science (2015): Impact factor 3.142
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 3.25 SJR 1.861 SNIP 1.492
Web of Science (2014): Impact factor 3.302
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 3.77 SJR 2.146 SNIP 1.633
Web of Science (2013): Impact factor 3.515
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 3.76 SJR 2.57 SNIP 1.739
Web of Science (2012): Impact factor 3.794
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 4.04 SJR 2.814 SNIP 1.917
Web of Science (2011): Impact factor 3.844
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes