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Coupling light to periodic nanostructures

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Bibliography

- [1] Aristophanes, *Clouds*, translated by Kenneth McLeish, Cambridge University Press, 423 B.C. (1979).
- [2] S. John, *Strong localization of photons in certain disordered dielectric superlattices*, Phys. Rev. Lett. **58**, 2486 (1987).
- [3] E. Yablonovitch, *Inhibited spontaneous emission in solid-state physics and electronics*, Phys. Rev. Lett. **58**, 2059 (1987).
- [4] K. J. Vahala, *Optical microcavities*, Nature **424**, 839 (2003).
- [5] C. Reese, B. Gayral, B. D. Gerardot, A. Imamoğlu, P. Petroff, and E. L. Hu, *High-Q photonic crystal microcavities fabricated in a thin GaAs membrane*, J. Vac. Sci. Technol. B **19**, 2749 (2001).
- [6] S. M. Thon, M. T. Rakher, H. Kim, J. Gudat, W. T. M. Irvine, P. M. Petroff, and D. Bouwmeester, *Strong coupling through optical positioning of a quantum dot in a photonic crystal cavity*, Appl. Phys. Lett. **94**, 111115 (2009).
- [7] A. Fiore, V. Berger, E. Rosencher, P. Bravetti, and J. Nagle, *Phase matching using an isotropic nonlinear optical material*, Nature **391**, 463 (1998).
- [8] J. P. Mondia, H. M. van Driel, W. Jiang, A. R. Cowan, and J. F. Young, *Enhanced second-harmonic generation from planar photonic crystals*, Opt. Lett. **28**, 2500 (2003).
- [9] M. J. A. de Dood, W. T. M. Irvine, and D. Bouwmeester, *Nonlinear photonic crystals as a source of entangled photons*, Phys. Rev. Lett. **93**, 040504 (2004).
- [10] E. Verhagen, A. Polman, and L. Kuipers, *Nanofocusing in laterally tapered plasmonic waveguides*, Opt. Express **16**, 45 (2008).
- [11] Z. Yu, G. Veronis, Z. Wang, and S. Fan, *One-way electromagnetic waveguide formed at the interface between a plasmonic metal under a static*

- magnetic field and a photonic crystal*, Phys. Rev. Lett. **100**, 023902 (2008).
- [12] E. Laux, C. Genet, T. Skauli, and T. Ebbesen, *Plasmonic photon sorters for spectral and polarimetric imaging*, Nat. Photon. **2**, 161 (2008).
- [13] F. Villa, L. E. Regalado, F. Ramos-Mendieta, J. Gaspar-Armenta, and T. Lopez-Rios, *Photonic crystal sensor based on surface waves for thin-film characterization*, Opt. Lett. **27**, 646 (2002).
- [14] P. Yeh, *Optical Waves in Layered Media*, John Wiley & Sons, Hoboken, N.J., 1998.
- [15] H. Raether, *Surface Plasmons on Smooth and Rough Surfaces and on Gratings*, Springer, 1988.
- [16] T. F. Krauss and R. M. De la Rue, *Photonic crystals in the optical regime - past, present and future*, Prog. Quant. Electron. **23**, 51 (1999).
- [17] H. Kosaka, T. Kawashima, A. Tomita, M. Notomi, T. Tamamura, T. Sato, and S. Kawakami, *Photonic crystals for micro lightwave circuits using wavelength-dependent angular beam steering*, Appl. Phys. Lett. **74**, 1370 (1999).
- [18] T. Yoshie, A. Scherer, J. Hendrickson, G. Khitrova, H. M. Gibbs, G. Rupper, C. Ell, O. B. Shchekin, and D. G. Deppe, *Vacuum Rabi splitting with a single quantum dot in a photonic crystal nanocavity*, Nature **432**, 200 (2004).
- [19] M. Kanskar, P. Paddon, V. Pacradouni, R. Morin, A. Busch, J. F. Young, S. R. Johnson, J. MacKenzie, and T. Tiedje, *Observation of leaky slab modes in an air-bridged semiconductor waveguide with a two-dimensional photonic lattice*, Appl. Phys. Lett. **70**, 1438 (1997).
- [20] V. N. Astratov, D. M. Whittaker, I. S. Culshaw, R. M. Stevenson, M. S. Skolnick, T. F. Krauss, and R. M. De la Rue, *Photonic band-structure effects in the reflectivity of periodically patterned waveguides*, Phys. Rev. B **60**, R16255 (1999).
- [21] L. Li, *New formulation of the Fourier modal method for crossed surface-relief gratings*, J. Opt. Soc. Am. A **14**, 2758 (1997).
- [22] D. M. Whittaker and I. S. Culshaw, *Scattering-matrix treatment of patterned multilayer photonic structures*, Phys. Rev. B **60**, 2610 (1999).
- [23] A. R. Cowan, P. Paddon, V. Pacradouni, and J. F. Young, *Resonant scattering and mode coupling in two-dimensional textured planar waveguides*, J. Opt. Soc. Am. A **18**, 1160 (2001).
- [24] S. Fan and J. D. Joannopoulos, *Analysis of guided resonances in photonic crystal slabs*, Phys. Rev. B **65**, 235112 (2002).

- [25] T. Ochiai and K. Sakoda, *Nearly free-photon approximation for two-dimensional photonic crystal slabs*, Phys. Rev. B **64**, 045108 (2001).
- [26] T. Ochiai and K. Sakoda, *Dispersion relation and optical transmittance of a hexagonal photonic crystal slab*, Phys. Rev. B **63**, 125107 (2001).
- [27] T. Maeda, J. W. Lee, R. J. Shul, J. Han, J. Hong, E. S. Lambers, S. J. Pearton, C. R. Abernathy, and W. S. Hobson, *Inductively coupled plasma etching of III-V semiconductors in BCl₃-based chemistries I. GaAs, GaN, GaP, GaSb and AlGaAs*, Appl. Surf. Sci. **143**, 174 (1999).
- [28] J. H. Kim, D. H. Lim, and G. M. Yang, *Selective etching of Al-GaAs/GaAs structures using the solutions of citric acid H₂O₂ and de-ionized H₂O buffered oxide etch*, J. Vac. Sci. Technol. B **16**, 558 (1998).
- [29] U. Fano, *Effects of Configuration Interaction on Intensities and Phase Shifts*, Phys. Rev. **124**, 1866 (1961).
- [30] S. Fan, W. Suh, and J. D. Joannopoulos, *Temporal coupled-mode theory for the Fano resonance in optical resonators*, J. Opt. Soc. Am. A **20**, 569 (2003).
- [31] W. Suh, Z. Wang, and S. Fan, *Temporal coupled-mode theory and the presence of non-orthogonal modes in lossless multimode cavities*, IEEE J. Quantum Elect. **40**, 1511 (2004).
- [32] D. Gerace and L. C. Andreani, *Gap maps and intrinsic diffraction losses in one-dimensional photonic crystal slabs*, Phys. Rev. E **69**, 056603 (2004).
- [33] A. Farjadpour, D. Roundy, A. Rodriguez, M. Ibanescu, P. Bermel, J. D. Joannopoulos, S. G. Johnson, and G. W. Burr, *Improving accuracy by subpixel smoothing in the finite-difference time domain*, Opt. Lett. **31**, 2972 (2006).
- [34] J. C. Maxwell Garnett, *Colours in Metal Glasses and in Metallic Films*, Philos. Trans. R. Soc. London Ser. A **203**, 385 (1904).
- [35] J. C. Maxwell Garnett, *Colours in Metal Glasses, in Metallic Films, and in Metallic Solutions. II*, Philos. Trans. R. Soc. London Ser. A **205**, 237 (1906).
- [36] W. L. Barnes, T. W. Preist, S. C. Kitson, and J. R. Sambles, *Physical origin of photonic energy gaps in the propagation of surface plasmons on gratings*, Phys. Rev. B **54**, 6227 (1996).
- [37] M. G. Moharam, E. B. Grann, D. A. Pommet, and T. K. Gaylord, *Formulation for stable and efficient implementation of the rigorous coupled-wave analysis of binary gratings*, J. Opt. Soc. Am. A **12**, 1068 (1995).
- [38] P. Paddon and J. F. Young, *Two-dimensional vector-coupled-mode theory for textured planar waveguides*, Phys. Rev. B **61**, 2090 (2000).

- [39] E. D. Palik, *Handbook of Optical Constants of Solids*, volume I, Academic Press, Inc., 1985.
- [40] E. Flück, *Local interaction of light with periodic photonic structures*, PhD thesis, University of Twente, 2003.
- [41] E. F. C. Driessen, D. Stolwijk, and M. J. A. de Dood, *Asymmetry reversal in the reflection from a two-dimensional photonic crystal*, *Opt. Lett.* **32**, 3137 (2007).
- [42] K. A. Tetz, L. Pang, and Y. Fainman, *High-resolution surface plasmon resonance sensor based on linewidth-optimized nanohole array transmittance*, *Opt. Lett.* **31**, 1528 (2006).
- [43] M. Born and E. Wolf, *Principles of Optics*, Pergamon Press, 6th edition, 1980.
- [44] L. C. Andreani and D. Gerace, *Photonic-crystal slabs with a triangular lattice of triangular holes investigated using a guided-mode expansion method*, *Phys. Rev. B* **73**, 235114 (2006).
- [45] D. S. Gao and Z. P. Zhou, *Nonlinear equation method for band structure calculations of photonic crystal slabs*, *Appl. Phys. Lett.* **88**, 163105 (2006).
- [46] M. Galli, M. Agio, L. C. Andreani, M. Belotti, G. Guizzetti, F. Marabelli, M. Patrini, P. Bettotti, L. Dal Negro, Z. Gaburro, L. Pavesi, A. Liu, and P. Bellutti, *Spectroscopy of photonic bands in macroporous silicon photonic crystals*, *Phys. Rev. B* **65**, 113111 (2002).
- [47] E. Altewischer, X. Ma, M. P. van Exter, and J. P. Woerdman, *Resonant Bragg scatter of surface plasmons on nanohole arrays*, *New J. Phys.* **8**, 57 (2006).
- [48] D. N. Chigrin, *Spatial distribution of the emission intensity in a photonic crystal: Self-interference of Bloch eigenwaves*, *Phys. Rev. A* **79**, 1 (2009).
- [49] E. Altewischer, X. Ma, M. P. van Exter, and J. P. Woerdman, *Fano-type interference in the point-spread function of nanohole arrays*, *Opt. Lett.* **30**, 2436 (2005).
- [50] T. Ebbesen, H. J. Lezec, H. Ghaemi, T. Thio, and P. A. Wolff, *Extraordinary optical transmission through sub-wavelength hole arrays*, *Nature* **391**, 667 (1998).
- [51] H. A. Bethe, *Theory of diffraction by small holes*, *Phys. Rev.* **66**, 163 (1944).
- [52] H. F. Ghaemi, T. Thio, D. E. Grupp, T. Ebbesen, and H. J. Lezec, *Surface plasmons enhance optical transmission through subwavelength holes*, *Phys. Rev. B* **58**, 6779 (1998).

- [53] U. Fano, *The theory of anomalous diffraction gratings and of quasi-stationary waves on metallic surfaces (Sommerfeld's waves)*, J. Opt. Soc. Am. **31**, 213 (1941).
- [54] C. Ropers, D. J. Park, G. Stibenz, G. Steinmeyer, J. Kim, D. S. Kim, and C. Lienau, *Femtosecond light transmission and subradiant damping in plasmonic crystals*, Phys. Rev. Lett. **94**, 113901 (2005).
- [55] C. Genet, M. P. van Exter, and J. P. Woerdman, *Huygens description of resonance phenomena in subwavelength hole arrays*, J. Opt. Soc. Am. A **22**, 998 (2005).
- [56] R. Wood, *Anomalous Diffraction Gratings*, Phys. Rev. **48**, 928 (1935).
- [57] E. Altewischer, M. P. van Exter, and J. P. Woerdman, *Polarization analysis of propagating surface plasmons in a subwavelength hole array*, J. Opt. Soc. Am. B **20**, 1927 (2003).
- [58] W. L. Barnes, W. A. Murray, J. Dintinger, E. Devaux, and T. Ebbesen, *Surface plasmon polaritons and their role in the enhanced transmission of light through periodic arrays of subwavelength holes in a metal film*, Phys. Rev. Lett. **92**, 107401 (2004).
- [59] K. L. van der Molen, K. J. Klein Koerkamp, S. Enoch, F. B. Segerink, N. F. van Hulst, and L. Kuipers, *Role of shape and localized resonances in extraordinary transmission through periodic arrays of subwavelength holes: Experiment and theory*, Phys. Rev. B **72**, 045421 (2005).
- [60] P. B. Johnson and R. W. Christy, *Optical constants of the noble metals*, Phys. Rev. B **6**, 4370 (1972).
- [61] S. C. Hohng, Y. C. Yoon, D. S. Kim, V. Malyarchuk, R. Muller, C. Lienau, J. W. Park, K. H. Yoo, J. Kim, H. Y. Ryu, and Q. H. Park, *Light emission from the shadows: Surface plasmon nano-optics at near and far fields*, Appl. Phys. Lett. **81**, 3239 (2002).
- [62] A. Adams, J. Moreland, P. K. Hansma, and Z. Schlesinger, *Light emission from surface-plasmon and waveguide modes excited by N atoms near a silver grating*, Phys. Rev. B **25**, 3457 (1982).
- [63] A. Yariv and P. Yeh, *Optical Waves in Crystals*, Wiley-Interscience, 2002.
- [64] A. Karalis, E. Lidorikis, M. Ibanescu, J. D. Joannopoulos, and M. Soljacic, *Surface-plasmon-assisted guiding of broadband slow and subwavelength light in air*, Phys. Rev. Lett. **95**, 063901 (2005).
- [65] Y. J. Chen, E. S. Koteles, R. J. Seymour, G. J. Sonek, and J. M. Balantyne, *Surface plasmons on gratings: coupling in the minigap regions*, Solid State Commun. **46**, 95 (1983).

- [66] H. Lochbihler, *Surface polaritons on gold-wire gratings*, Phys. Rev. B **50**, 4795 (1994).
- [67] A. Christ, S. G. Tikhodeev, N. A. Gippius, J. Kuhl, and H. Giessen, *Waveguide-plasmon polaritons: Strong coupling of photonic and electronic resonances in a metallic photonic crystal slab*, Phys. Rev. Lett. **91**, 183901 (2003).
- [68] T. Zentgraf, A. Christ, J. Kuhl, and H. Giessen, *Tailoring the ultrafast dephasing of quasiparticles in metallic photonic crystals*, Phys. Rev. Lett. **93**, 243901 (2004).
- [69] A. Krishnan, T. Thio, T. J. Kima, H. J. Lezec, T. Ebbesen, P. A. Wolff, J. B. Pendry, L. Martín-Moreno, and F. J. García-Vidal, *Evanescently coupled resonance in surface plasmon enhanced transmission*, Opt. Commun. **200**, 1 (2001).
- [70] L. Martín-Moreno, F. J. García-Vidal, H. J. Lezec, K. M. Pellerin, T. Thio, J. B. Pendry, and T. Ebbesen, *Theory of extraordinary optical transmission through subwavelength hole arrays*, Phys. Rev. Lett. **86**, 1114 (2001).
- [71] L. Pang, K. A. Tetz, and Y. Fainman, *Observation of the splitting of degenerate surface plasmon polariton modes in a two-dimensional metallic nanohole array*, Appl. Phys. Lett. **90**, 111103 (2007).
- [72] F. J. García de Abajo, *Colloquium: Light scattering by particle and hole arrays*, Rev. Mod. Phys. **79**, 1267 (2007).
- [73] C. Genet, M. P. van Exter, and J. P. Woerdman, *Fano-type interpretation of red shifts and red tails in hole array transmission spectra*, Opt. Commun. **225**, 331 (2003).
- [74] M. Sarrazin, J. P. Vigneron, and J. M. Vigoureux, *Role of Wood anomalies in optical properties of thin metallic films with a bidimensional array of subwavelength holes*, Phys. Rev. B **67**, 085415 (2003).
- [75] R. J. C. Spreeuw, R. Centeno Neelen, N. J. van Druten, E. R. Eliel, and J. P. Woerdman, *Mode coupling in a He-Ne ring laser with backscattering*, Phys. Rev. A **42**, 4315 (1990).
- [76] R. J. C. Spreeuw, N. J. van Druten, M. Beijersbergen, E. R. Eliel, and J. P. Woerdman, *Classical realization of a strongly driven two-level system*, Phys. Rev. Lett. **65**, 2642 (1990).
- [77] S. G. Johnson, M. Ibanescu, M. A. Skorobogatiy, O. Weisberg, J. D. Joannopoulos, and Y. Fink, *Perturbation theory for Maxwell's equations with shifting material boundaries*, Phys. Rev. E **65**, 066611 (2002).
- [78] D. S. Kim, S. C. Hohng, V. Malyarchuk, Y. C. Yoon, Y. H. Ahn, K. J. Yee, J. W. Park, J. Kim, Q. H. Park, and C. Lienau, *Microscopic origin of*

- surface-plasmon radiation in plasmonic band-gap nanostructures*, Phys. Rev. Lett. **91**, 143901 (2003).
- [79] G. N. Gol'tsman, O. Okunev, G. Chulkova, A. Lipatov, A. Semenov, K. Smirnov, B. M. Voronov, A. Dzardanov, C. Williams, and R. R. Sobolewski, *Picosecond superconducting single-photon optical detector*, Appl. Phys. Lett. **79**, 705 (2001).
- [80] G. N. Gol'tsman, O. Minaeva, A. Korneev, M. Tarkhov, I. Rubtsova, A. Divochiy, I. Milostnaya, G. Chulkova, N. Kaurova, B. M. Voronov, D. Pan, J. Kitaygorsky, A. S. Cross, A. J. Pearlman, I. Komissarov, W. Słysz, M. Węgrzecki, P. Grabiec, and R. R. Sobolewski, *Middle-infrared to visible-light ultrafast superconducting single-photon detectors*, IEEE Trans. Appl. Supercond. **17**, 246 (2007).
- [81] H. Takesue, S. W. Nam, Q. Zhang, R. H. Hadfield, T. Honjo, K. Tamaki, and Y. Yamamoto, *Quantum key distribution over a 40-dB channel loss using superconducting single-photon detectors*, Nat. Photon. **1**, 343 (2007).
- [82] A. Semenov, A. Engel, K. Il'in, G. N. Gol'tsman, M. Siegel, and H.-W. Hübers, *Ultimate performance of a superconducting quantum detector*, Eur. Phys. J.-Appl. Phys. **21**, 171 (2003).
- [83] A. J. Kerman, E. A. Dauler, W. E. Keicher, J. K. W. Yang, K. K. Berggren, G. N. Gol'tsman, and B. M. Voronov, *Kinetic-inductance-limited reset time of superconducting nanowire photon counters*, Appl. Phys. Lett. **88**, 111116 (2006).
- [84] M. Ejrnaes, R. Cristiano, O. Quaranta, S. Pagano, A. Gaggero, F. Mattioli, R. Leoni, B. Voronov, and G. N. Gol'tsman, *A cascade switching superconducting single photon detector*, Appl. Phys. Lett. **91**, 262509 (2007).
- [85] V. Anant, A. J. Kerman, E. A. Dauler, J. K. W. Yang, K. M. Rosfjord, and K. K. Berggren, *Optical properties of superconducting nanowire single-photon detectors*, Opt. Express **16**, 10750 (2008).
- [86] D. Bouwmeester, A. K. Ekert, and A. Zeilinger, *The Physics of Quantum Information*, Springer, 2000.
- [87] A. Engel, A. Semenov, H.-W. Hübers, K. Il'in, and M. Siegel, *Fluctuation effects in superconducting nanostrips*, Physica C **444**, 12 (2006).
- [88] M. Bell, N. Kaurova, A. Divochiy, G. N. Gol'tsman, J. Bird, A. Sergeev, and A. A. Verevkin, *On the nature of resistive transition in disordered superconducting nanowires*, IEEE Trans. Appl. Supercond. **17**, 267 (2007).
- [89] K. M. Rosfjord, J. K. W. Yang, E. A. Dauler, A. J. Kerman, V. Anant, B. M. Voronov, G. N. Gol'tsman, and K. K. Berggren, *Nanowire Single-*

- photon detector with an integrated optical cavity and anti-reflection coating*, *Opt. Express* **14**, 527 (2006).
- [90] S. N. Dorenbos, *Fabrication and characterization of superconducting detectors for single photon counting*, MSc Thesis, Delft University of Technology, 2007.
- [91] A. A. Verevkin, J. Zhang, R. R. Sobolewski, A. Lipatov, O. Okunev, G. Chulkova, A. Korneev, K. Smirnov, G. N. Gol'tsman, and A. Semenov, *Detection efficiency of large-active-area NbN single-photon superconducting detectors in the ultraviolet to near-infrared range*, *Appl. Phys. Lett.* **80**, 4687 (2002).
- [92] A. Korneev, Y. Vachtomin, O. Minaeva, A. Divochiy, K. Smirnov, O. Okunev, G. N. Gol'tsman, C. Zinoni, N. Chauvin, L. Balet, F. Marsili, D. Bitauld, B. Alloing, L. Li, A. Fiore, L. Lunghi, A. Gerardino, M. Halder, C. Jorel, and H. Zbinden, *Single-photon detection system for quantum optics applications*, *IEEE J. Sel. Top. Quant.* **13**, 944 (2007).
- [93] E. Reiger, S. N. Dorenbos, V. Zwiller, A. Korneev, G. Chulkova, I. Milostnaya, O. Minaeva, G. N. Gol'tsman, J. Kitaygorsky, D. Pan, W. Słysz, A. Jukna, and R. R. Sobolewski, *Spectroscopy with nanostructured superconducting single photon detectors*, *IEEE J. Sel. Top. Quant.* **13**, 934 (2007).
- [94] G. R. Bird and M. Parrish, *The wire grid as a near-infrared polarizer*, *J. Opt. Soc. Am.* **50**, 886 (1960).
- [95] D. E. Aspnes, *Local-field effects and effective-medium theory: a microscopic perspective*, *Am. J. Phys.* **50**, 704 (1982).
- [96] J. M. Pitarke and F. J. García-Vidal, *Effective electronic response of a system of metallic cylinders*, *Phys. Rev. B* **57**, 15261 (1998).
- [97] E. D. Palik, *Handbook of Optical Constants of Solids*, volume III, Academic Press, 1998.
- [98] K. Tanabe, H. Asano, Y. Katoh, and O. Michikami, *Ellipsometric and optical reflectivity studies of reactively sputtered NbN thin films*, *J. Appl. Phys.* **63**, 1733 (1988).
- [99] W.-J. Lee, J.-E. Kim, H. Y. Park, S. Park, M.-S. Kim, J. T. Kim, and J. J. Ju, *Optical constants of evaporated gold films measured by surface plasmon resonance at telecommunication wavelengths*, *J. Appl. Phys.* **103**, 073713 (2008).
- [100] S. N. Dorenbos, E. Reiger, N. Akopian, U. Perinetti, V. Zwiller, T. Zijlstra, and T. M. Klapwijk, *Superconducting single photon detectors with minimized polarization dependence*, *Appl. Phys. Lett.* **93**, 161102 (2008).

- [101] S. Ramo and J. R. Whinnery, *Fields and Waves in Modern Radio*, John Wiley & Sons, 2nd edition, 1953.
- [102] K. E. Kornelsen, M. Dressel, J. E. Eldridge, M. J. Brett, and K. L. Westra, *Far-infrared optical absorption and reflectivity of a superconducting NbN film*, Phys. Rev. B **44**, 11882 (1991).
- [103] A. A. Verevkin, A. J. Pearlman, W. Slysz, J. Zhang, M. Currie, A. Korneev, G. Chulkova, O. Okunev, P. Kouminov, K. Smirnov, B. M. Voronov, G. N. Gol'tsman, and R. R. Sobolewski, *Ultrafast superconducting single-photon detectors for near-infrared-wavelength quantum communications*, J. Mod. Optic. **51**, 1447 (2004).
- [104] A. Jukna, J. Kitaygorsky, D. Pan, A. S. Cross, A. J. Pearlman, I. Komisarov, O. Okunev, K. Smirnov, A. Korneev, G. Chulkova, I. Milostnaya, B. M. Voronov, G. N. Gol'tsman, and R. R. Sobolewski, *Dynamics of hotspot formation in nanostructured superconducting stripes excited with single photons*, Acta Phys. Pol. A **113**, 955 (2008).
- [105] F. Z. Yang, J. R. Sambles, and G. W. Bradberry, *Long-range surface modes supported by thin films*, Phys. Rev. B **44**, 5855 (1991).
- [106] Z. Yu, G. Veronis, S. Fan, and M. L. Brongersma, *Design of midinfrared photodetectors enhanced by surface plasmons on grating structures*, Appl. Phys. Lett. **89**, 151116 (2006).
- [107] S. Bandiera, D. Jacob, T. Muller, F. Marquier, M. Laroche, and J.-J. Greffet, *Enhanced absorption by nanostructured silicon*, Appl. Phys. Lett. **93**, 193103 (2008).
- [108] A. J. Miller, S. W. Nam, J. M. Martinis, and A. V. Sergienko, *Demonstration of a low-noise near-infrared photon counter with multiphoton discrimination*, Appl. Phys. Lett. **83**, 791 (2003).
- [109] E. F. Driessen, F. R. Braakman, E. M. Reiger, S. N. Dorenbos, V. Zwiller, and M. J. D. Dood, *Impedance model for the polarization-dependent optical absorption of superconducting single-photon detectors*, Eur. Phys. J.-Appl. Phys. **47**, 1 (2009).
- [110] E. Kretschman and H. Raether, *Radiative decay of non-radiative surface plasmons excited by light*, Z. Naturforsch. A **23**, 2135 (1968).

