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Sommario/riassunto

Holger Bartolf discusses state-of-the-art detection concepts based on superconducting nanotechnology as well as sophisticated analytical formulæ that model dissipative fluctuation-phenomena in superconducting nanowire single-photon detectors. Such knowledge is desirable for the development of advanced devices which are designed to possess an intrinsic robustness against vortex-fluctuations and it provides the perspective for honorable fundamental science in condensed matter physics. Especially the nanowire detector allows for ultra-low noise detection of signals with single-photon sensitivity and GHz repetition rates. Such devices have a huge potential for future technological impact and might enable unique applications (e.g. high rate interplanetary deep-space data links from Mars to Earth). Contents Superconducting Single-Photon Detectors Nanotechnological Manufacturing; Scale: 10 Nanometer Berezinskii-Kosterlitz Thouless (BKT) Transition, Edge-Barrier, Phase Slips Target Groups Researchers and students of physics in the fields of single-photon devices, nanofabrication, nanophotonics, nanoelectronics and superconductivity Industrial practitioners with focus on nanotechnology and single-photon detectors About the Author Holger Bartolf studied Solid State Physics at the Universities of Karlsruhe and Zürich. In 2011 he relocated at the Swiss Corporate Research Center of a leading company in power and automation technologies where his current interests focus on the applied R&D of the next generation of power semiconductors.