

*Non-invasive single-electron detectors of charged particles
in framework of cyclostationary processes*

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Abstract

Detection of moving charge in free space is presented in the framework of single electron CMOS devices [1-2]. It opens the perspective for construction of new type detectors for beam diagnostic in accelerators or for the detection of solar wind. General phenomenological model of noise acting on position based qubit implemented in semiconductor quantum dots is given in the framework of simplistic tight-binding model. Furthermore the effect of accelerator beam on the system of 2 electrostatically coupled qubits is formulated by tight-binding equations. The position based qubits of various topologies are described as quantum detectors of moving electric charge [3]. Electrons confined in chain of coupled quantum dots has periodic occupancy in certain space regions that can be treated as the source of harmonic signal while passage of external charged particles can be recognized as external noise that affects the system equilibrium.

Literature

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