

Silicon Drift Detectors for basic and applied research

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The Silicon Drift Detector (SDD) is a detector nowadays employed in an increasing number of applications either in basic and applied research. The SDD shows basic advantages, in terms of energy resolution and detection rate, with respect to conventional X-ray detectors. These advantages are strictly related to the very low values of output capacitance of these devices. The SDD has been also successfully employed as photodetector for the scintillation light in gamma-ray applications. In this talk the topologies and the performances of the most recent devices are presented. The requirements of front-end devices and electronics circuits for the readout and filtering of the SDDs signals are also shortly discussed. Some relevant applications of SDDs in the field of X-ray spectroscopy, like exotic atoms experiments (INFN SIDDHARTA experiment), and in gamma-ray imaging applications for medical diagnostic and molecular imaging, are presented. Perspectives of applications of SDDs in nuclear monitoring and gamma-ray astronomy will be also addressed.