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Charge carrier mobility evaluation in Silicon Microstrips detectors exploiting megnetoresistivity effect

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Silicon Microstrips detectors were considered as suitable for charge carrier mobility evaluation from magnetoresistivity (MR) phenomena. The top contacts geometry is potentially similar to Corbino disk, which is also used for MR with Hall electric field elimination. However, the appearance of negative MR caused by nonlinear electric field distribution prompted to search for alternative approaches including surface carrier excitation with light, modeling or the usage of bottom contact to translate direct current through the diode structure up to the linear response region. With completing more challenges related to geometrical factors, the detectors were evaluated after 1MeV neutron irradiation in the fluence range from 10^{15} to 10^{17} cm^{-2} . MR mobility and conductivity measurements enable to evaluate charge carrier density and the temperature dependency extracted thermal activation energy.

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