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Time resolution of 50 um thin LGAD before and after irradiation in beam tests

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Silicon Low-Gain Avalanche Detectors (LGAD) are a promising technology for high energy physics experiments where high precision segmented timing sensors are required. This can be used for example in the ATLAS High Granularity Timing Detector (HGTD) or forward experiments like the ATLAS Forward Proton (AFP) and CMS-TOTEM Precision Proton Spectrometer (CT-PPS) for pileup removal.
LGAD from a recent CNM production on a 50 um thin substrate were tested before and after neutron irradiation to 3e14 and 1e15 neq/cm2 at AFP beam tests in July and September 2016 at CERN SPS.
A time resolution of ~30 ps was achieved, even after irradiations to 3e14 neq/cm2. The challenges to perform these measurements are discussed and the results are presented.

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