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Measurements of the timing resolution of Ultra-Fast Silicon Detectors vs. Temperature, Fluence, Thickness, Manufacturer.

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We report on the performance of UFSD (Ultra-Fast Silicon Detectors) from two vendors CNM (LGAD thickness 45um) and HPK (LGAD thickness 50 and 80um).
We have measured pre-rad and after neutron fluences of 6e14 and 2e15 n/cm^2 the leakage current, gain, time jitter, time resolution and the value of Landau fluctuations. The pre-rad measurements were performed at three temperatures (+20C, 0C, -20C) and the post-rad measurements at -20C.
We find that LGAD with higher initial doping concentration achieve post-rad higher gain and better time resolution.
We find a clear advantage of using the thinner LGAD because of the contribution of the Landau Fluctuation to the time resolution.

Primary author: SADROZINSKI, Hartmut (University of California,Santa Cruz (US))

Presenter: SADROZINSKI, Hartmut (University of California,Santa Cruz (US))

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