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The first TPA signal in LGAD (HPK-P2/HGTD and FBK-W1/UFSD) and PIN using the ELI fs-laser

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The first TPA signal in LGAD at the TPA/SPA experimental research station, that is under development at the premises of the research infrastructure and laser facility ELI Beamlines, is presented. The RD50 campaign at ELI's site for the ELI fs- beam profile study and TPA signature was conducted in Oct/Nov 2020 and performed under the ELI User Call Framework after an application by Montenegro team was submitted to the ELI User Call on the behalf of the RD50 Collaboration and accepted as the user experiment with priority. The study was performed on LGADs (HPK-P2 (HGTD):WF25, FBK (UFSD):W1) and their reference PIN sensors. Active thickness of INFN LGAD is 55 μm and support wafer is 570 μm , while active thickness of HPK-P2 is 50 μm and support wafer is 200 μm . The TPA signal is obtained by focusing fs-1550 nm beam by X100 NIR APO objective. The sensor samples were illuminated in the centre of PAD. The TPA control pots, the spatial beam profile characterisation and sensor (LGAD& PIN) characterisation (gain layer depletion and full depletion voltage) will be presented. This program will continue at ELI in future.

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