

Timing Status Freiburg

17.12.2020

Albert-Ludwigs-Universität Freiburg



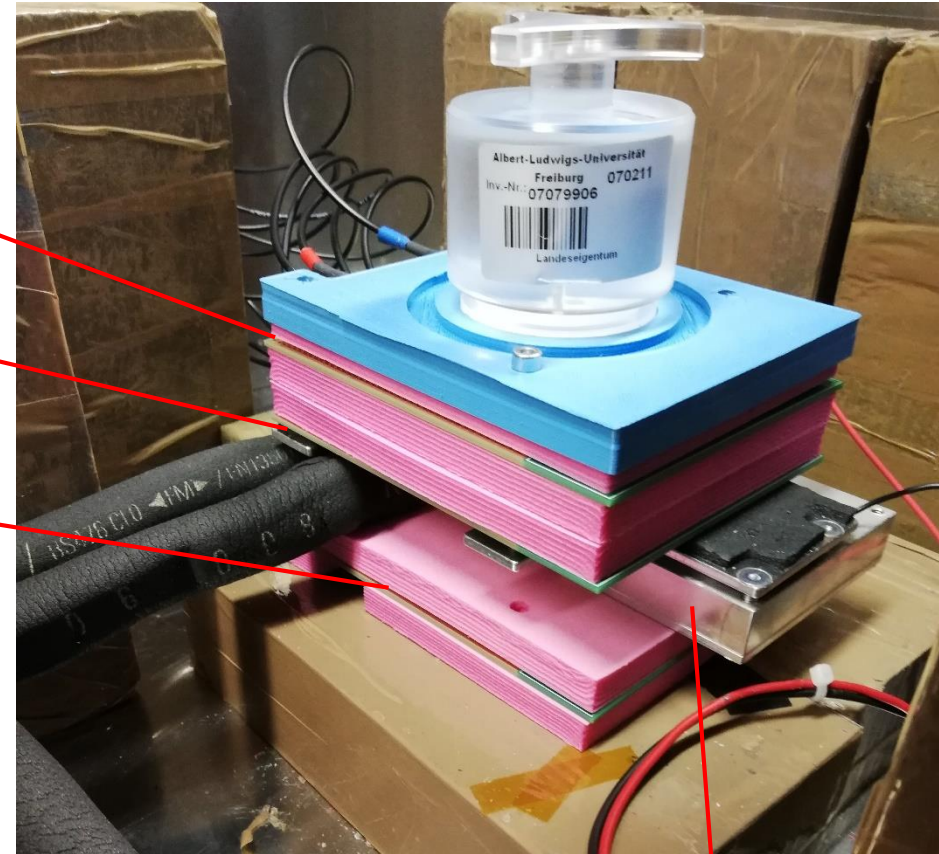
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Setup and some troubles

- Particulars amplifiers used
- Trigger on all three sensors (Pattern trigger)
- Cooling not sufficient yet, needs to be improved
- Alignment of the diode board needs to be fixed
- We had a lot of noise issues, that are fixed now

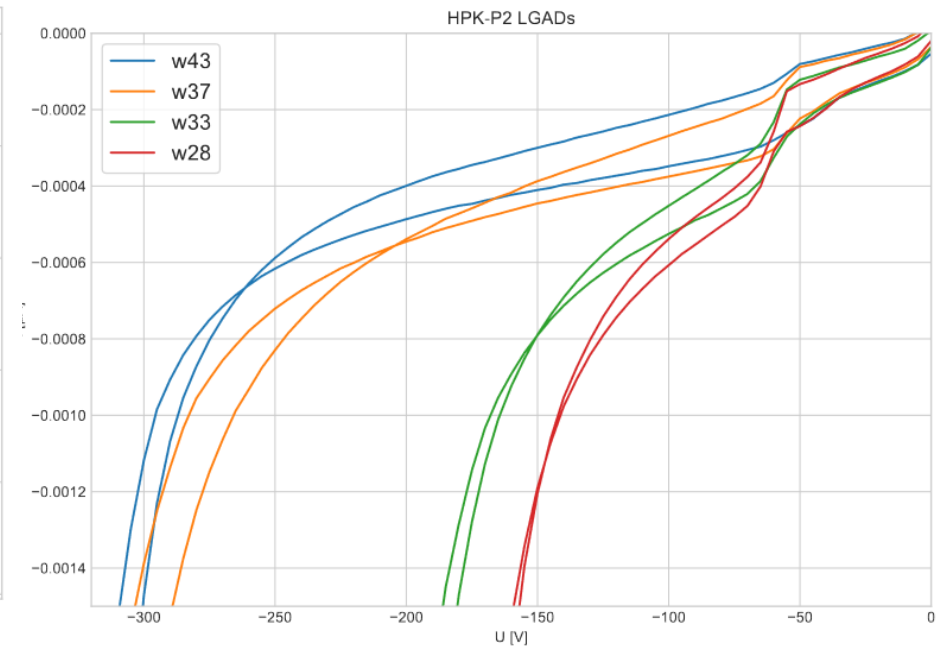
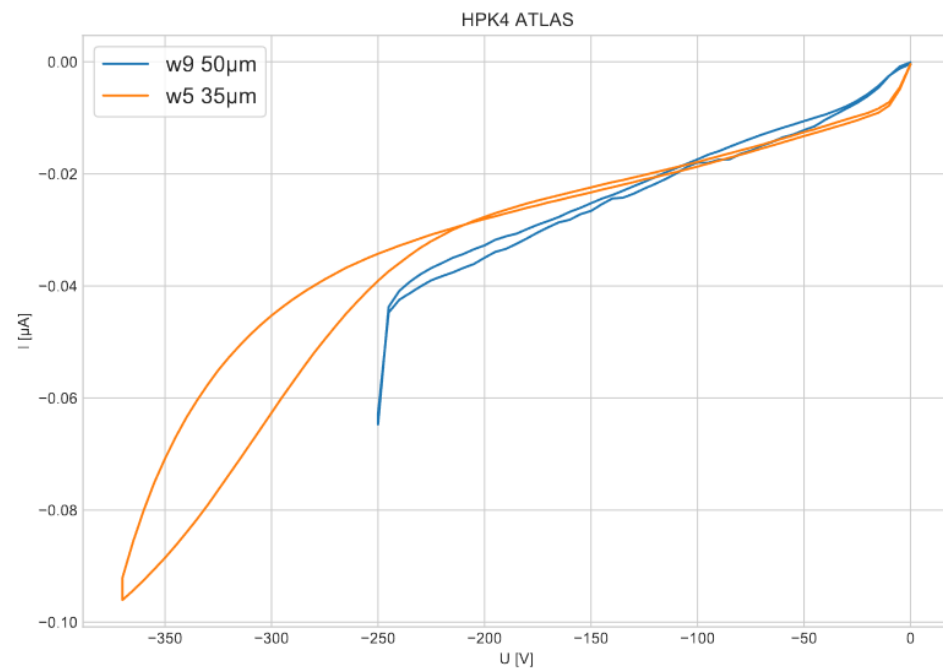
- Testing different LGADs for being the final reference sensor right now

LGAD board
DUT board
Diode board



Chiller+Peltier+
Mounting Stage

- HPK LGADs, 35/50 μm active layer, different wafers
- Sensor capacitance: 3.5-3.7 pF
- Target V_{br} between 160V and 240V



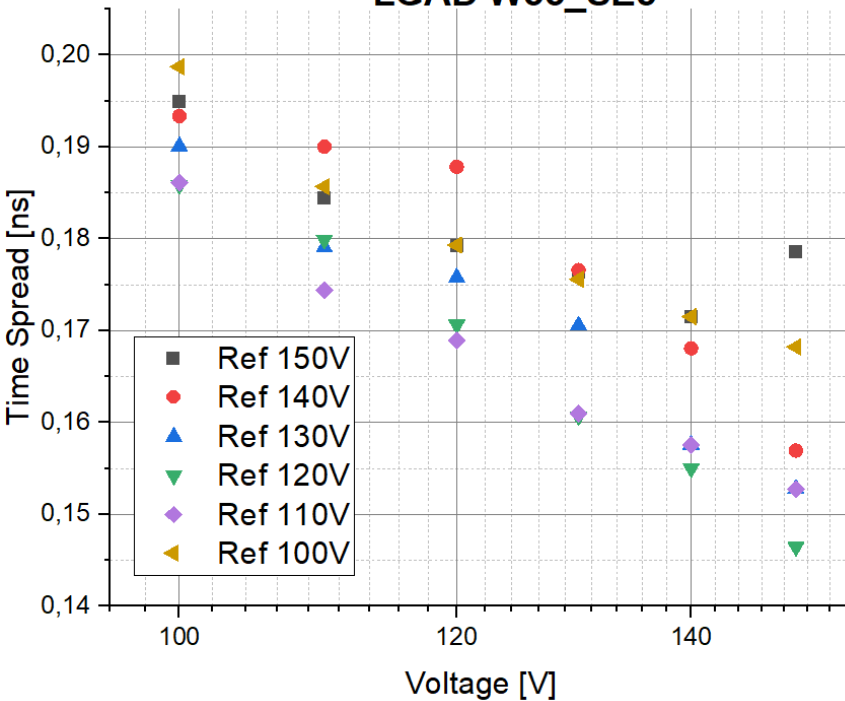
Timing measurements

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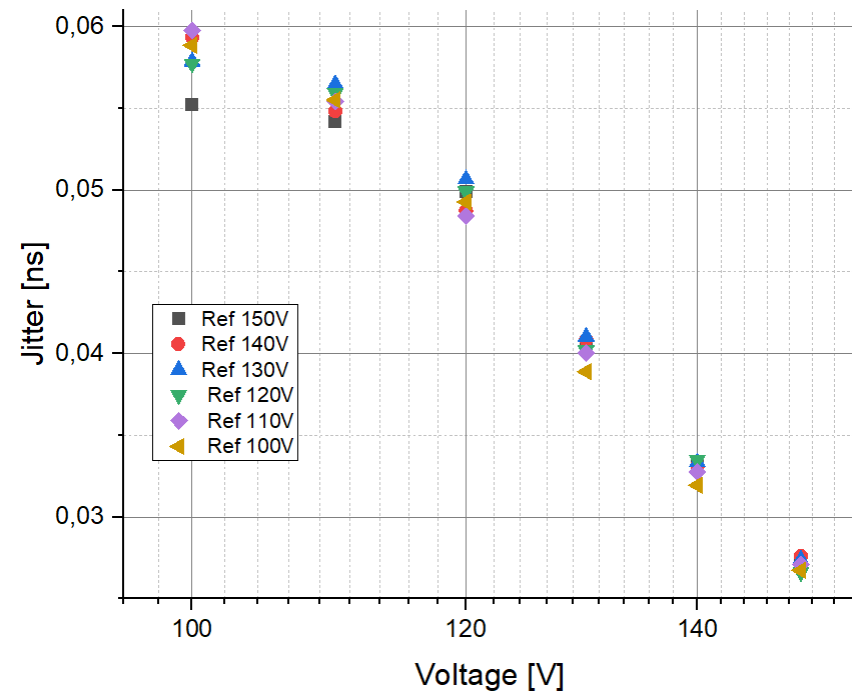
Reference Sensor: W33 SE3 – 50 μm

DUT W33-SE5, 2x2 LGAD -50 μm

LGAD W33_SE5



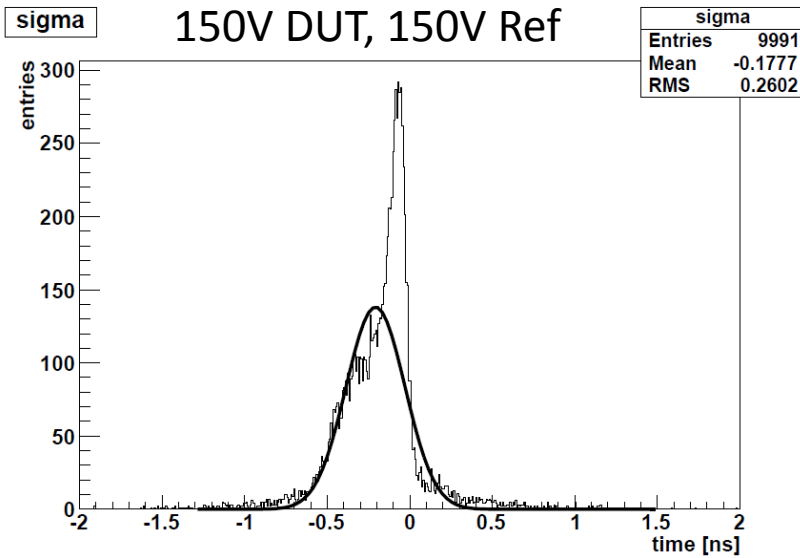
LGAD W33_SE5



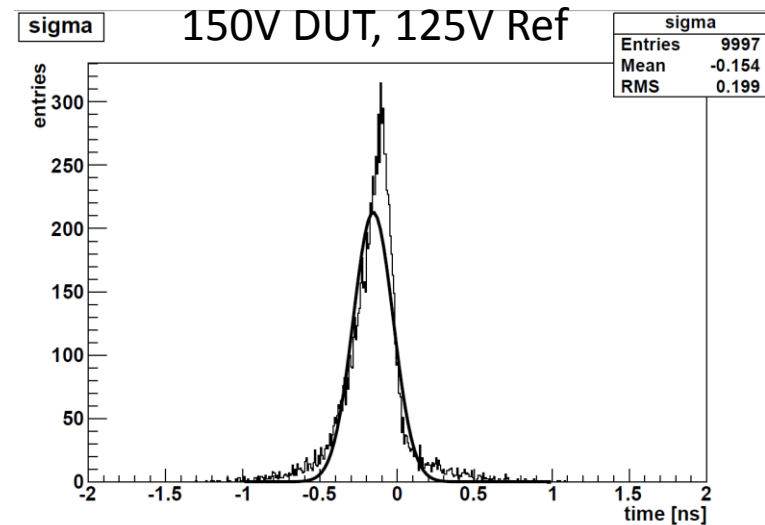
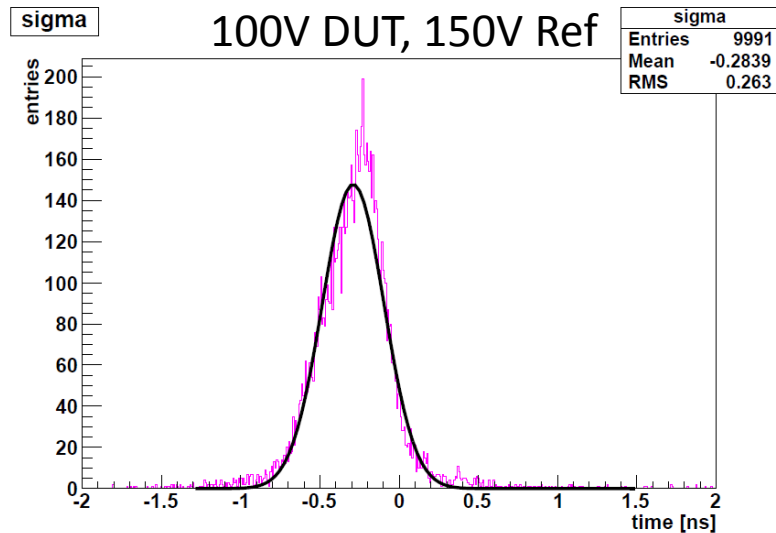
- Jitter is stable & consistent, time spread depends on reference voltage – we chose 120V for this sensor. Currently testing a 35 μm sensor as reference.
- Values are too high compared with measurements in Ljubljana – possibly lacking resolution of the oscilloscope

Time Spread

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Reference Sensor: W33 SE3 – 50 μm
DUT W33-SE5, 2x2 LGAD -50 μm



- IR Laser, focus slightly beneath surface
- 3D sensor: Strip Sensor, 80x80 cell size
- Junction column in (760,195)
- Currently trying to improve the measurement by splitting and delaying the laser pulse
- Time spread analysis with the trigger pulse is not always consistent yet
- Need to improve positioning (so far positioning manually)
- Slope of the pulses shows a sensor profile -> this type of measurement can be useful for timing measurements

