

Comments on optical system for calibration

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Present system: one tile – one optical fibre
→ it is very complicated system

Idea: use one fibre for more tiles, ideally one row of tiles – one fibre

How to do it?

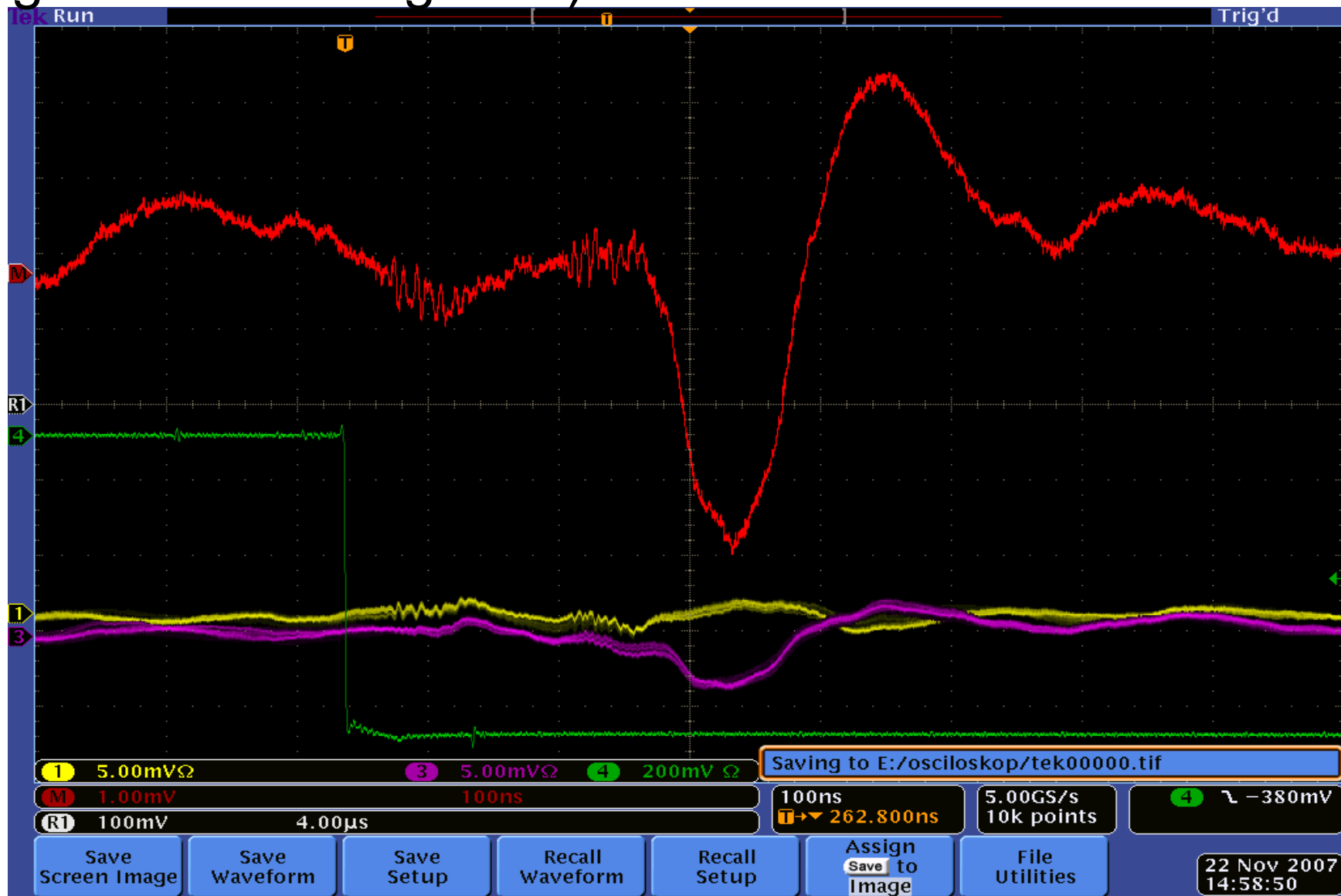
- Side-emitting fibre
- Classical end-emitting fibre with some “damage” effecting side-lighting

Side-emitting fibres

- In principal the easiest solution – to buy, lace through tiles and connect to LED driver
- Problem to find thin ($\sim 1\text{mm}$) fibres for test moreover not know parameters of this fibres
- Price ? (Higher than for standard fibres)
- Non-uniformity of light in tiles (attenuation)
- Need to focus enough LED light into fibre (~ 100 more than present)

Side-emitting fibre

Test: SLL600UVT from FiberTech - Germany
(long-length side-emitting fibre)



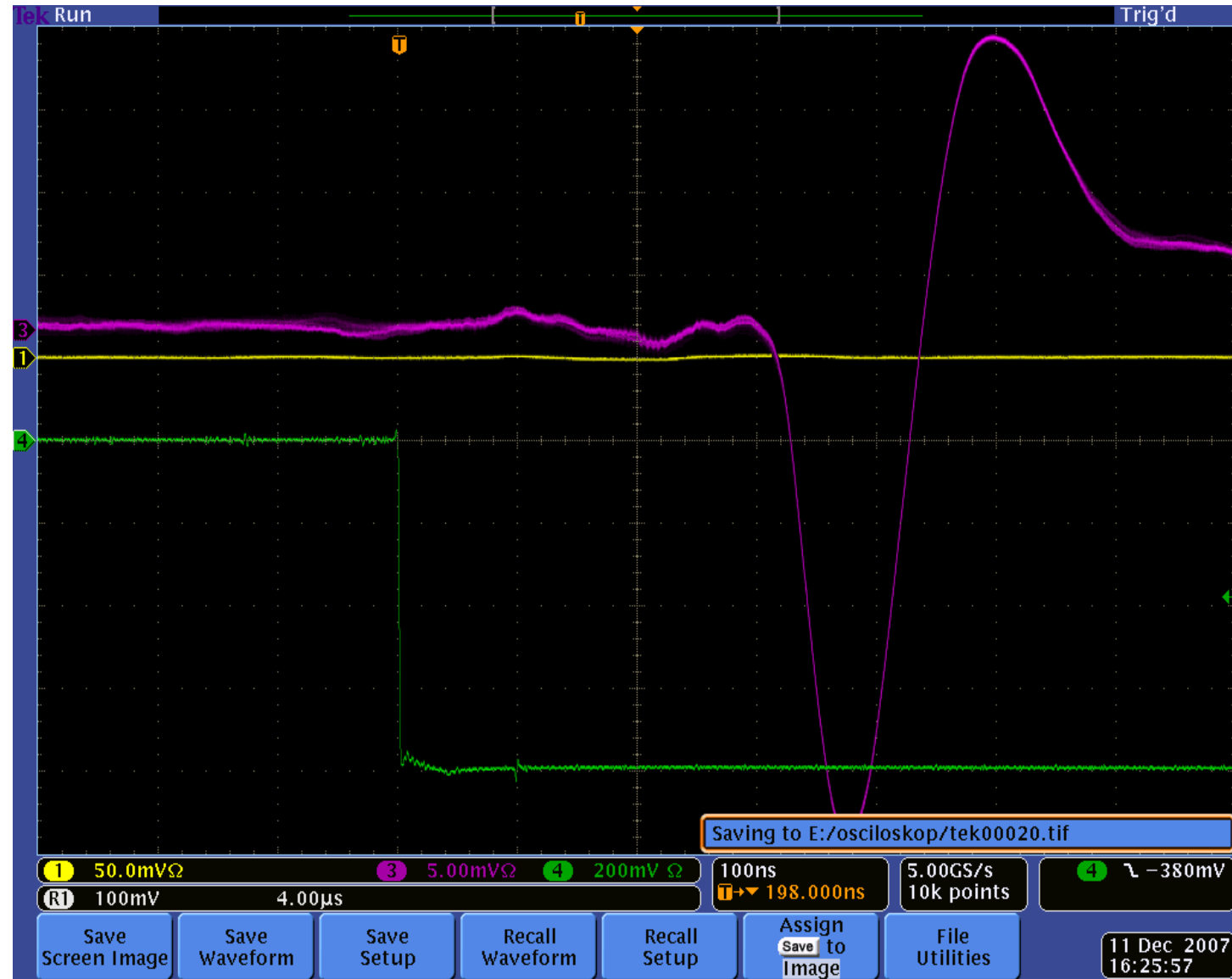
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Classical fibres

- Low costs – many suppliers
- Need additional modification to produce side light – remove cladding or to bend fibre
($<$ minimum bending radius, curvature shape?)
- More complicated installation
- Need to focus enough LED light into fibre

Classical fibres

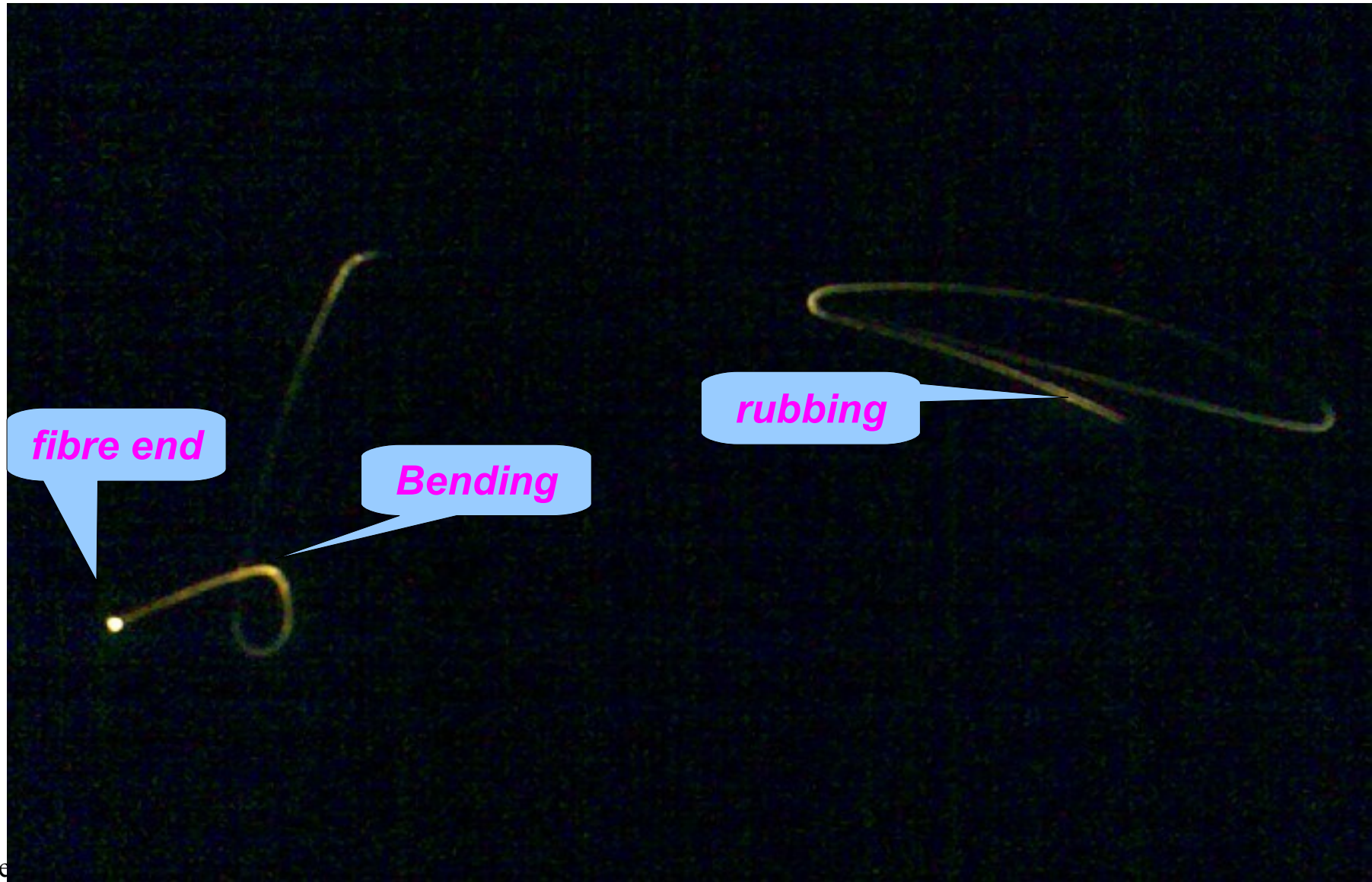
Test: CK40 from Mitsubishi Rayon Corporation



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Classical fibres

“Processed” fibre – light emitting



Conclusion

- Both fibres generate signal in tiles – from side-emitting is smaller – need to test a different type (getting short-length fibre)
- About to test new UV/Blue LEDs to get enough light
- For developing of system for new prototype of TileHCAL we need at least two tiles with SiPM detectors and readout electronics