Beam Loss Monitor by Cerenkov Effect

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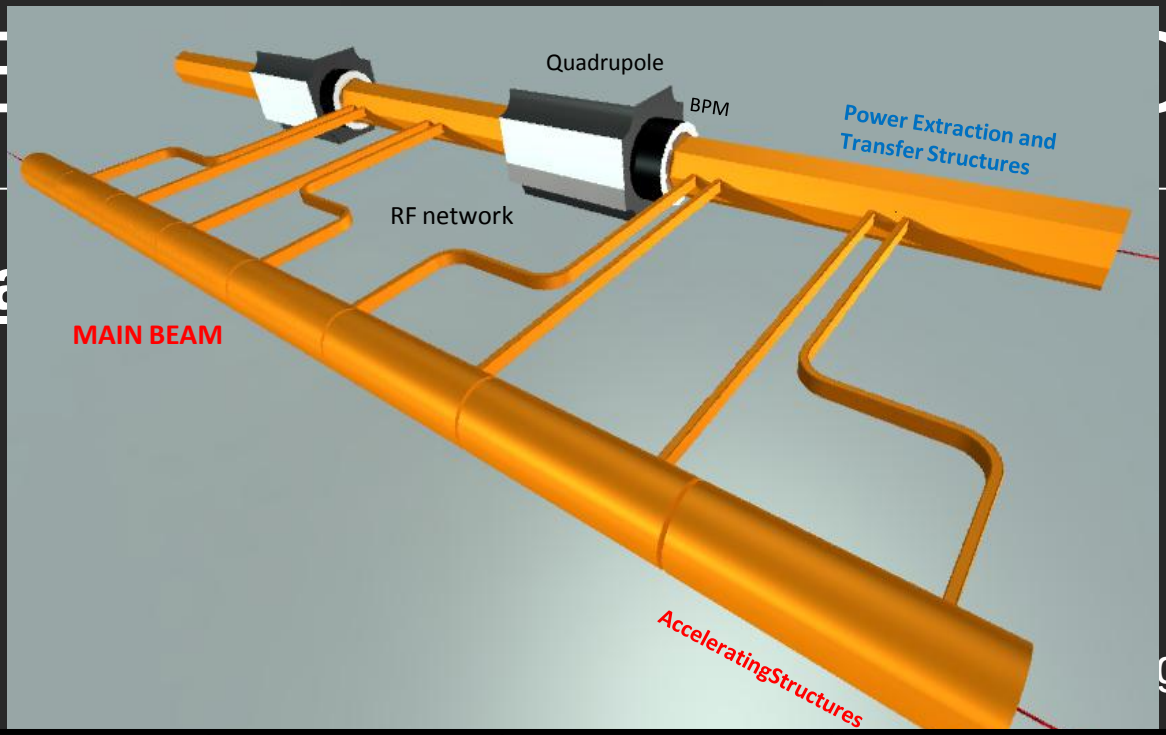
Overview

- Goals and requirement of a beam loss monitor at Clex
- Beam loss monitoring by optical fibres
- SiPMs (Silicon Photmultipliers) as loss detectors
- Conclusions

B Clex

- **Mea**



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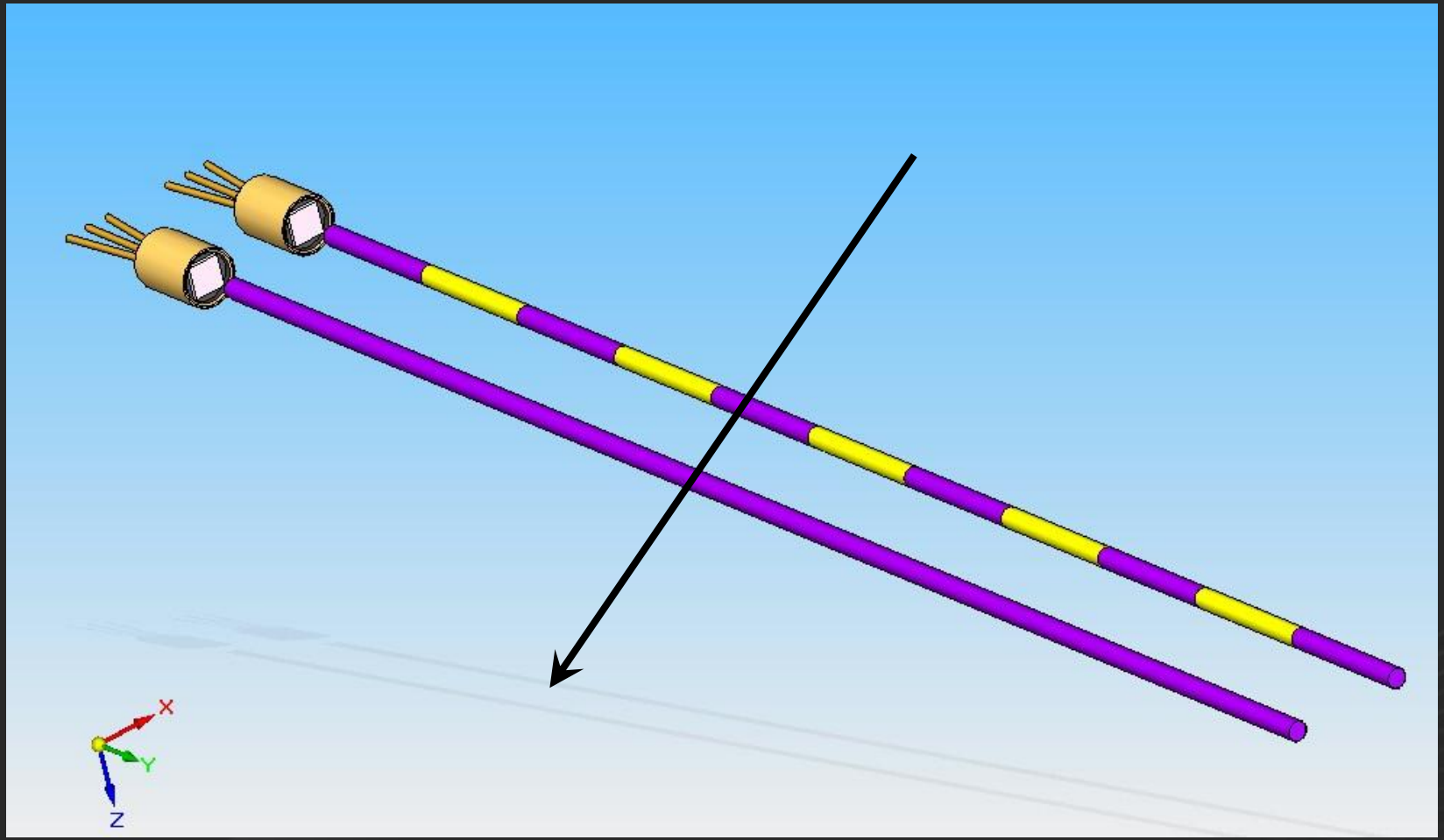
	E (GeV)	e^-_{loss}/ year	Consequence for electronics
Main Beam	1500	1 E14	Unacceptably high failure rate
Main Beam	9	1 E15	More failures per year
Drive Beam	2.4	1 E16	Few failures per year
Drive Beam	0.24	1 E17	Few failures over lifetime

Beam Loss Monitor Design



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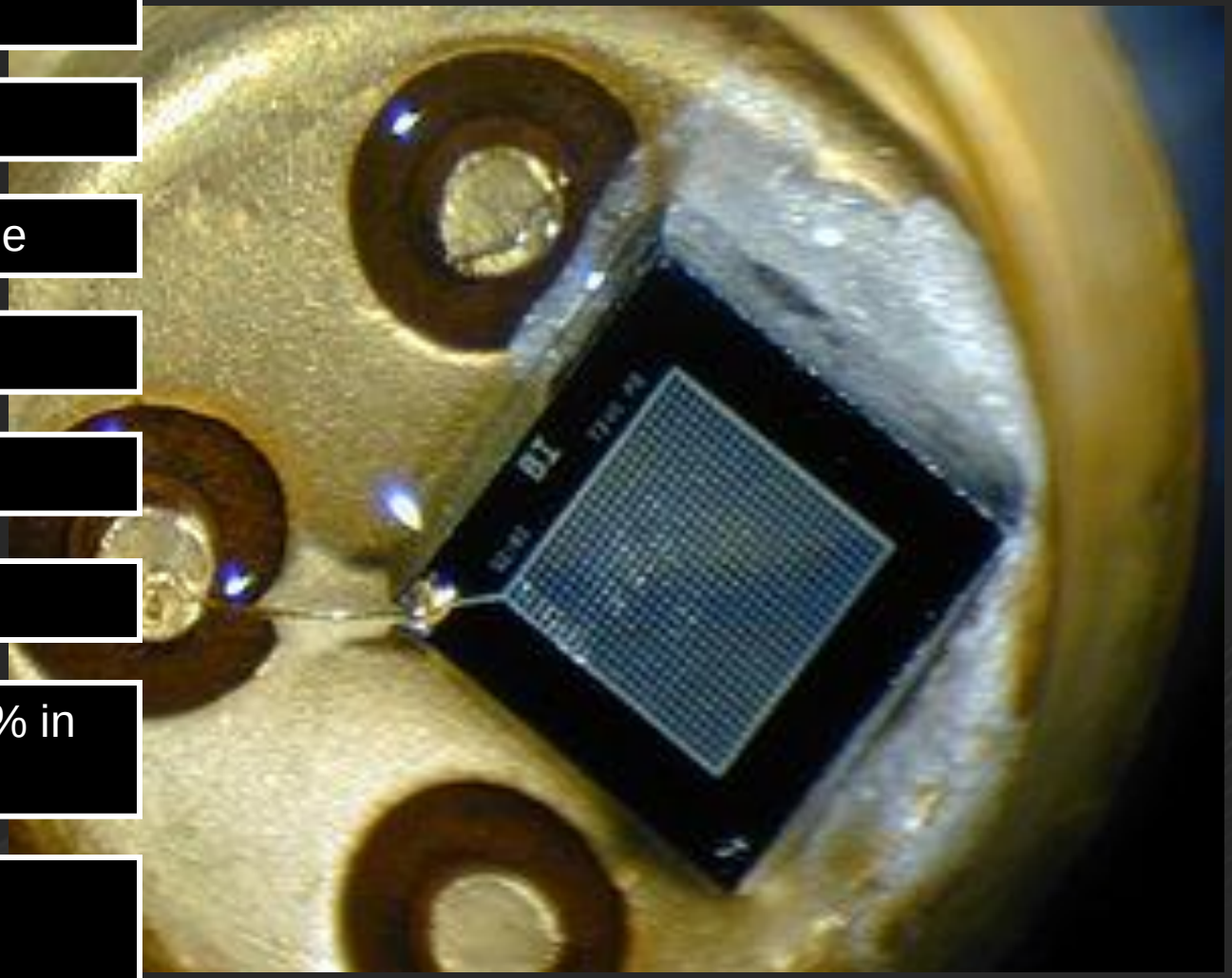
Silicon Photomultipliers (SiPMs)

- 400-500 SPAD array
- Active surface 1mm^2
- Very short recovery time
- 1 photon detection
- CMOS technology
- Low cost detector
- Quantum efficiency 15% in blue range
- Immunity to external magnetic fields



Conclusions

- Demonstrated the feasibility of the sensor
- Testing of different SiPMs
- Influence of dark count rate on the real signal
- Next step: preliminary installation at Cern

Thanks for your attention!

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