P.N.Lebedev Physical Institute of the Russian Academy of Science

UNIVERSITY OF LIVERPOOL

The Cockcroft Institute of Accelerator Science and Technology

SEVENTH FRAMEWORK PROGRAMME SiPM

cost EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

FAST Fast Advanced Scintillator Timing

Discussion: SiPM nonlinearity and saturation

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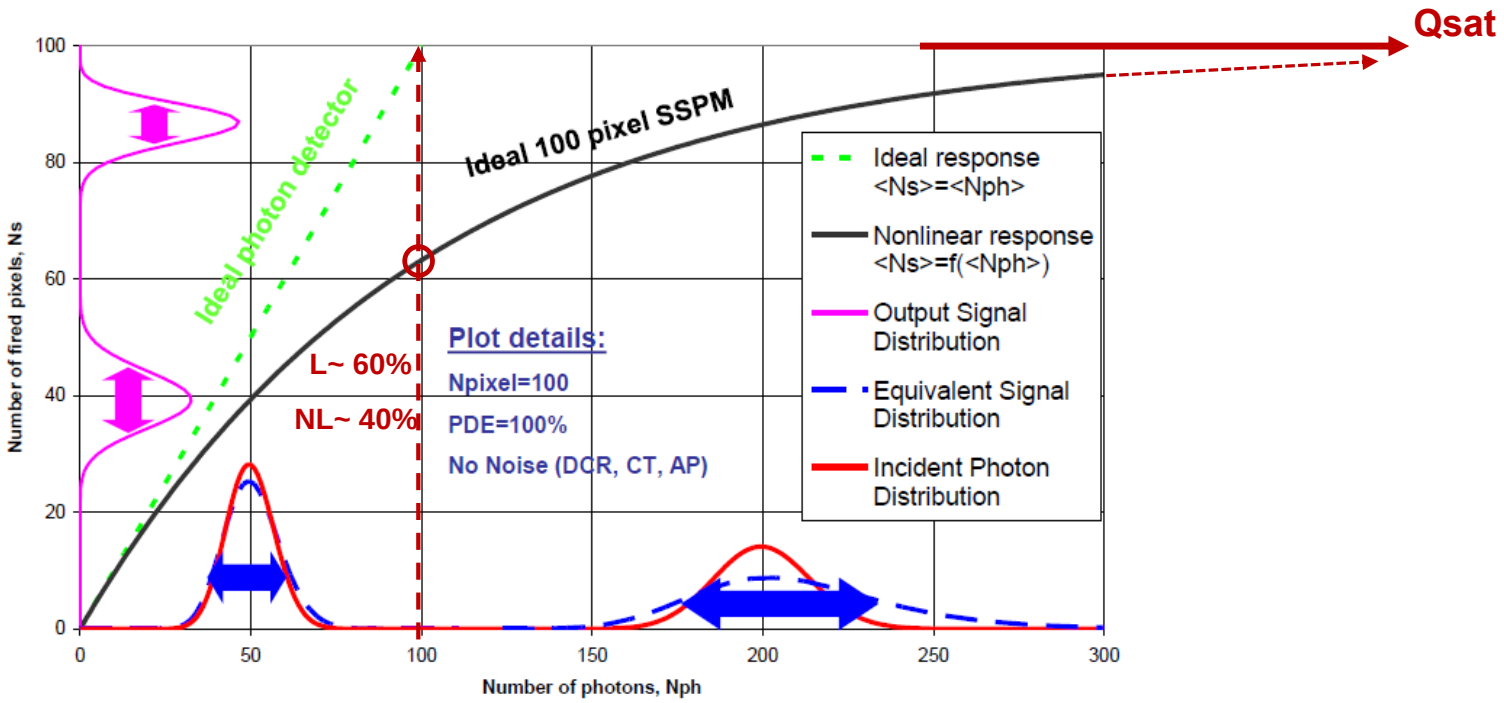
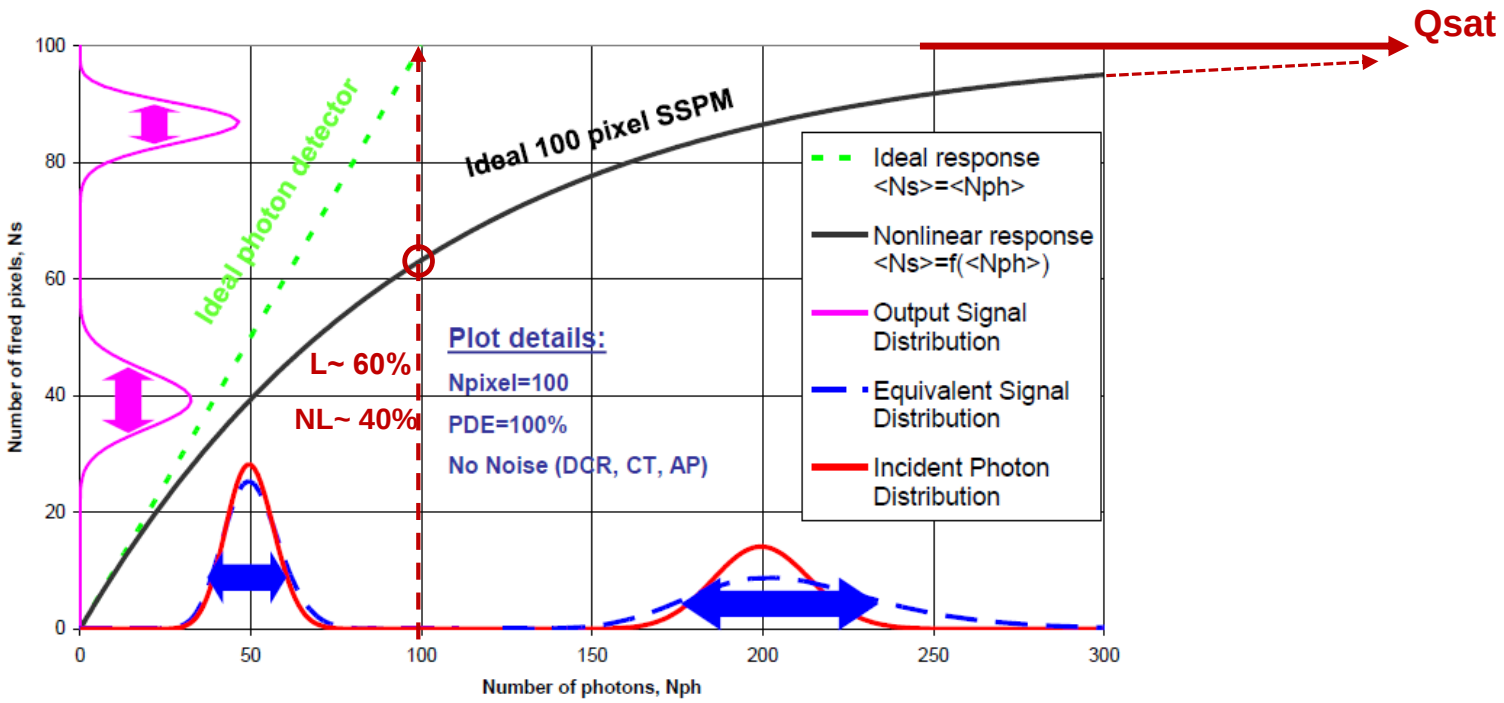
Calibration of SiPM responsivity

- **Recommendations on methods of SiPM calibration**
  - Self-calibration based (Double Light Superposition)
  - Reference photodetector based
- What do you think?

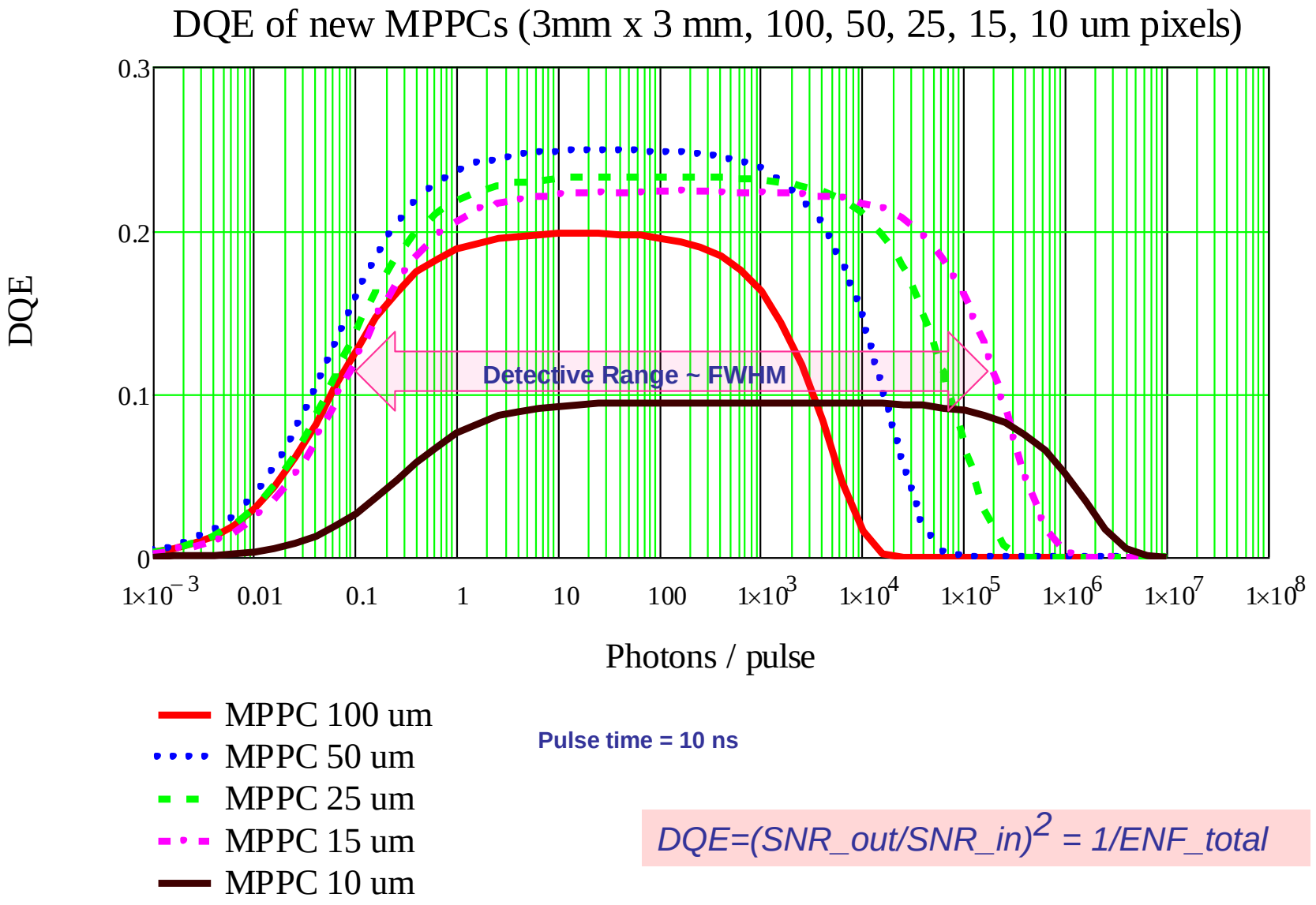


New definition: Detective Range

- **Dynamic range as a range of linear response is not consistent**
  - Lower limit is defined by threshold sensitivity which depends on photon statistics with weak dependence on photodetector
  - Upper limit is defined by some arbitrary level of nonlinearity (xx%)
  - Dynamic range does not directly reflect performance
- Detective range - a range of good performance in photon number resolution



Detective Quantum Efficiency → Detective Range



$DQE=(SNR\_out/SNR\_in)^2 = 1/ENF\_total$

The end

Thank you for your attention!

Questions?

Objections?

Opinions?

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