

A simulation tool for a Silicon Photomultiplier coupled to a scintillating fiber



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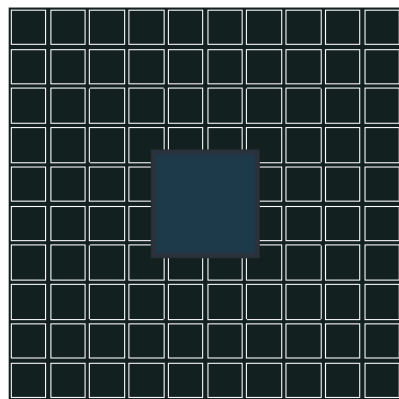


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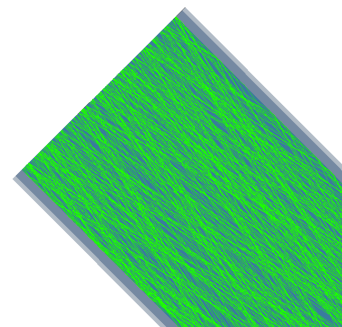
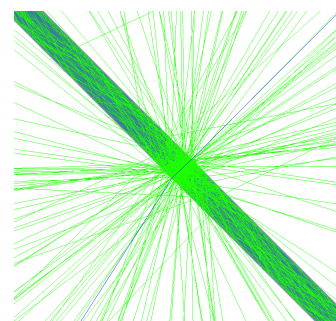
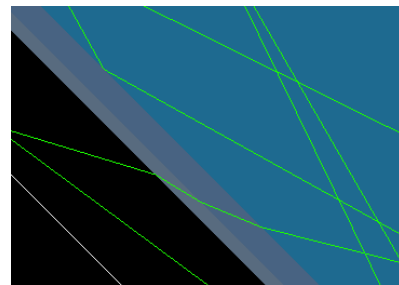
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Geometry and physics processes

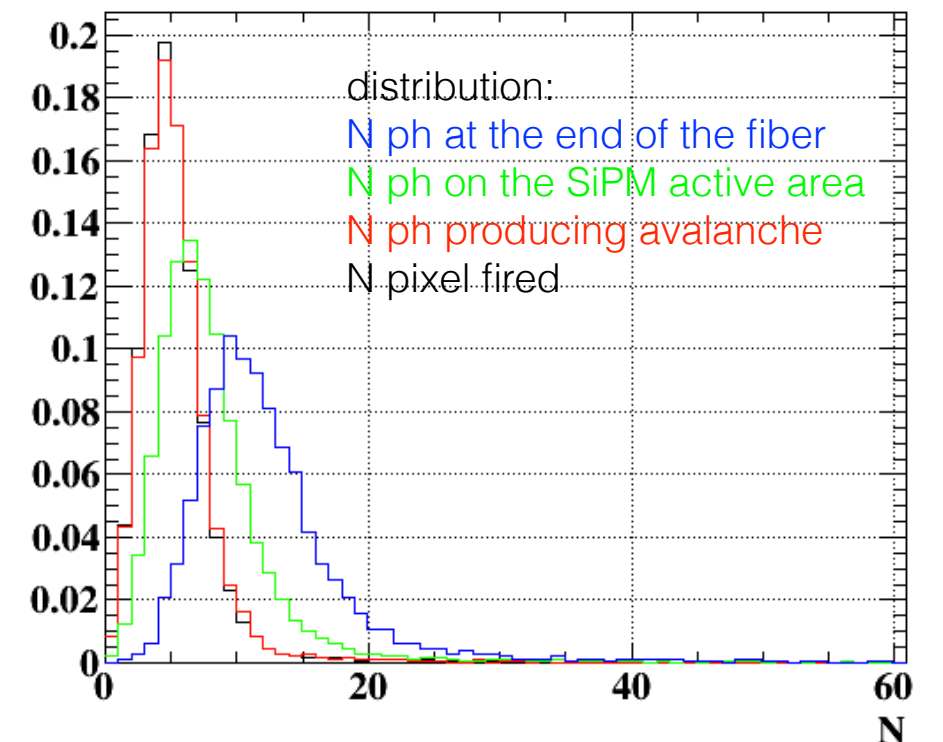


Geant 4 based simulation:

- Minimum ionizing electrons from Sr90
- optical surface tuning
- accurate simulation of the multi-clad fiber
- accurate simulation of the SiPM geometry



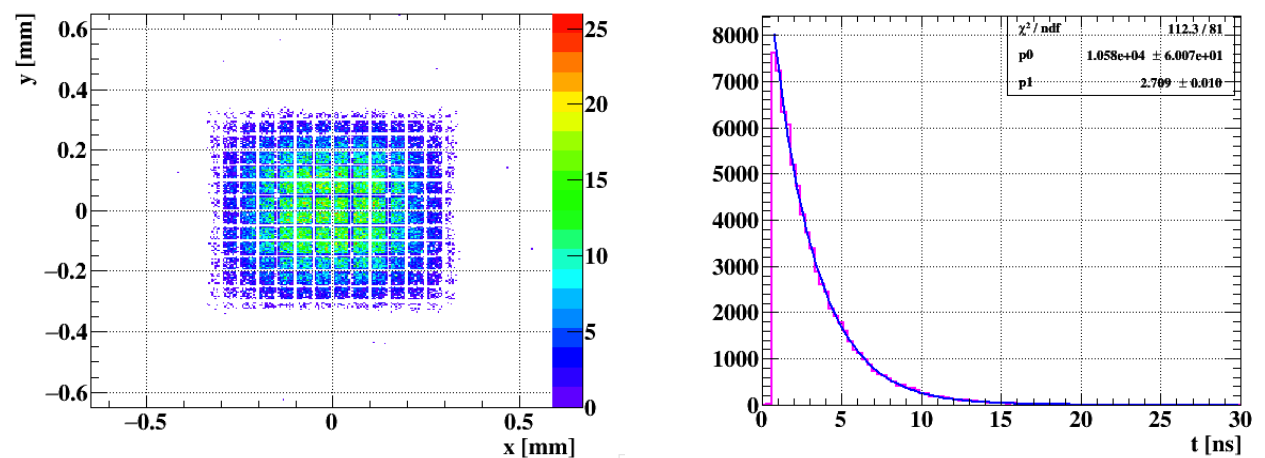
Modulation of the light collected at the end of the fiber



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Simulation of the SiPM response

Infos from Geant 4: time and position on SiPM active area



Method description:

1. The single pixel signal is produced with a probability given by the quantum efficiency ($\sim 35\%$ divided by the fill factor) times the discharge probability (almost 1).
2. Non-uniform single pixel gain obtain by data
3. A crosstalk signal is generated in the near pixels with a probability of 1 %.
4. Pixel saturation effect is taken into account assuming a time recovery of 15 ns
5. Dark current pulses are randomly generated on the SiPM surface
6. After pulse probability ~ 0

