

PMT layout and orientation in CD

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PMTs

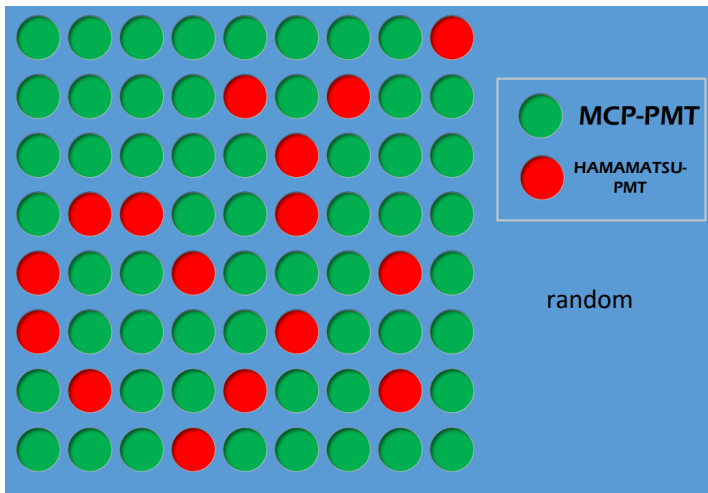
We have two types of PMT:

HAMAMATSU (about 5k)& NNVT(about 15k), in general:

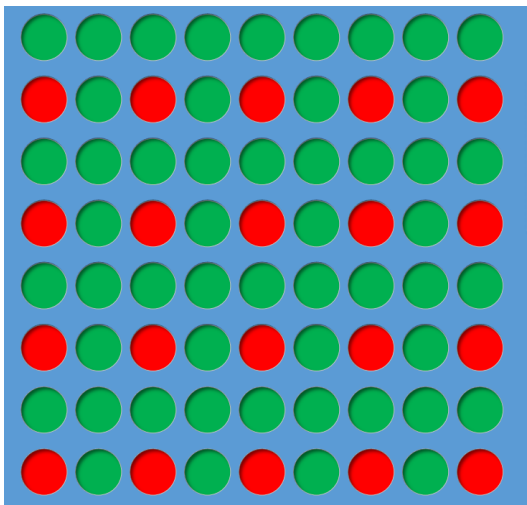
表: PMT typical performance

Performance	PDE	DCR	TTS	uniformity
HAMAMATSU	lower%	20 kHz	3ns	worse
NNVT	higher%	40kHz	7ns	better

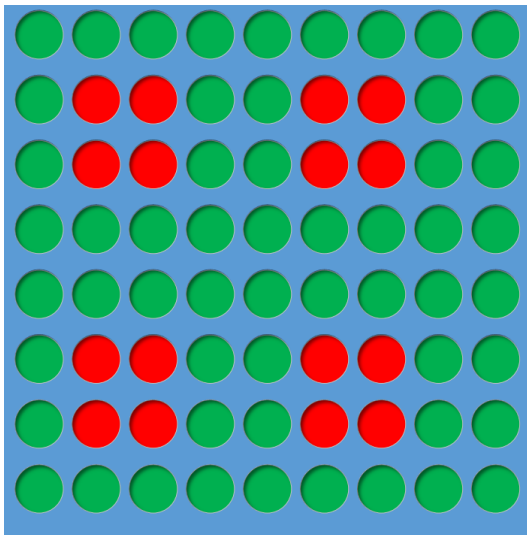
patterns



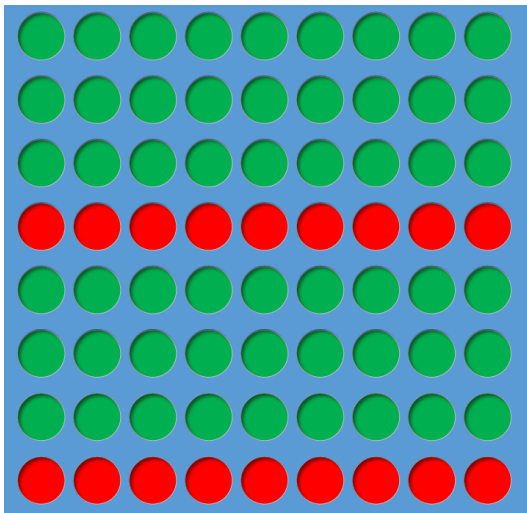
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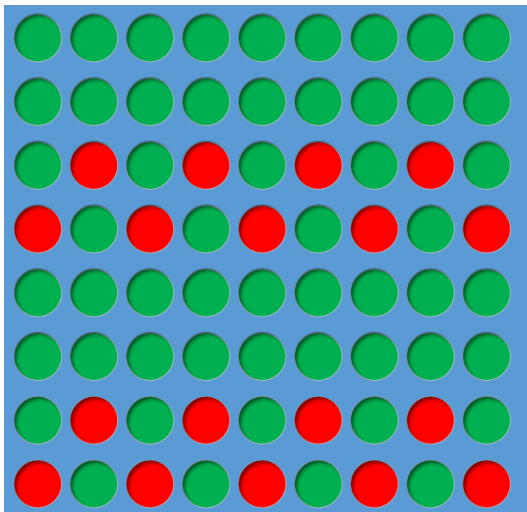
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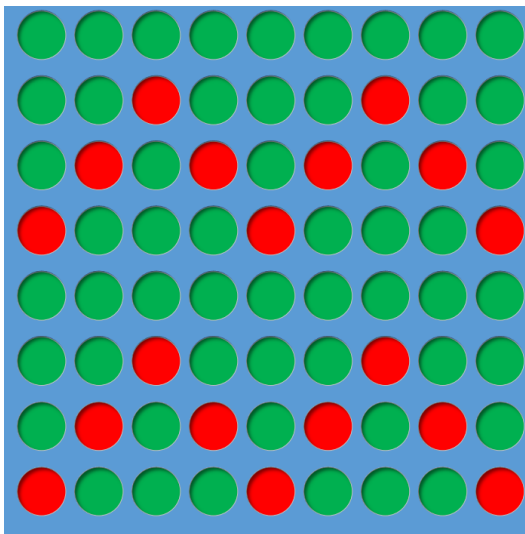
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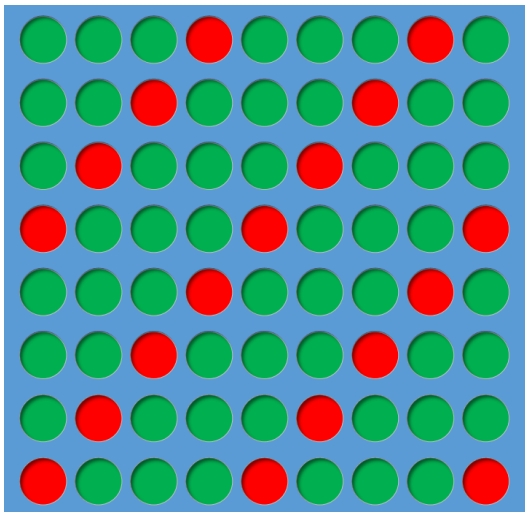
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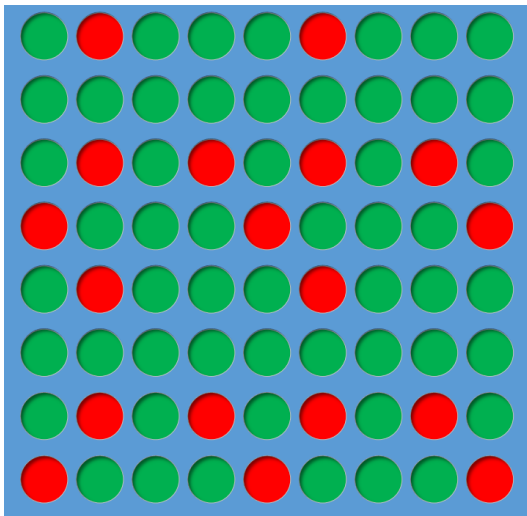
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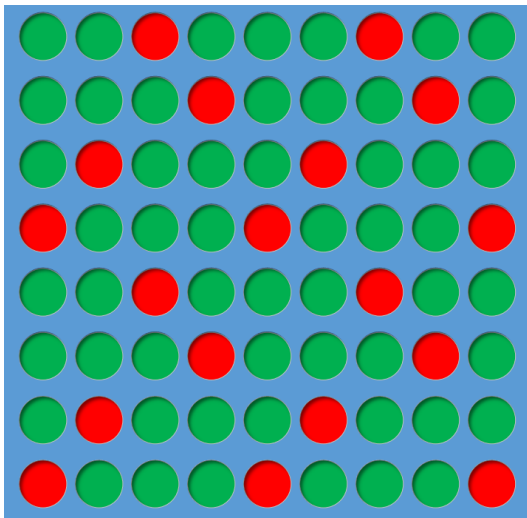
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patterns



JUNO offline

compare detector performance with the different PMT patterns, especially the time and energy resolution and reconstruction results.

how to: add method to the PMT class then each PMT can get its performance according to the layout pattern and its own ID.

HAMAMATSU PMTs

the PDE uniformity of HAMAMATSU PMTs are not so good
we can artificially correct the PDE if these PMTs have fixed orientation
and we can extract the light incident angle using reconstruction
information.

Thank You