Comparison of Scintillating Fiber and Diamond Detector Data

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BNL
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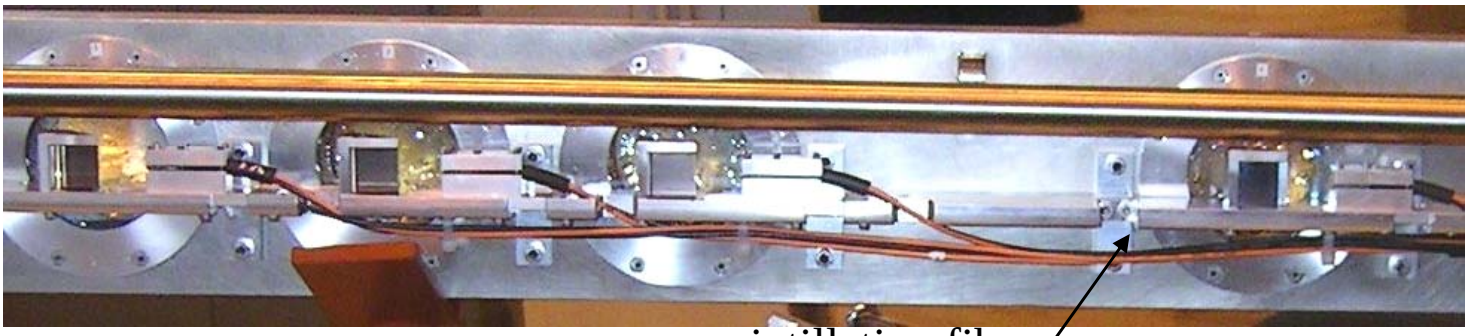
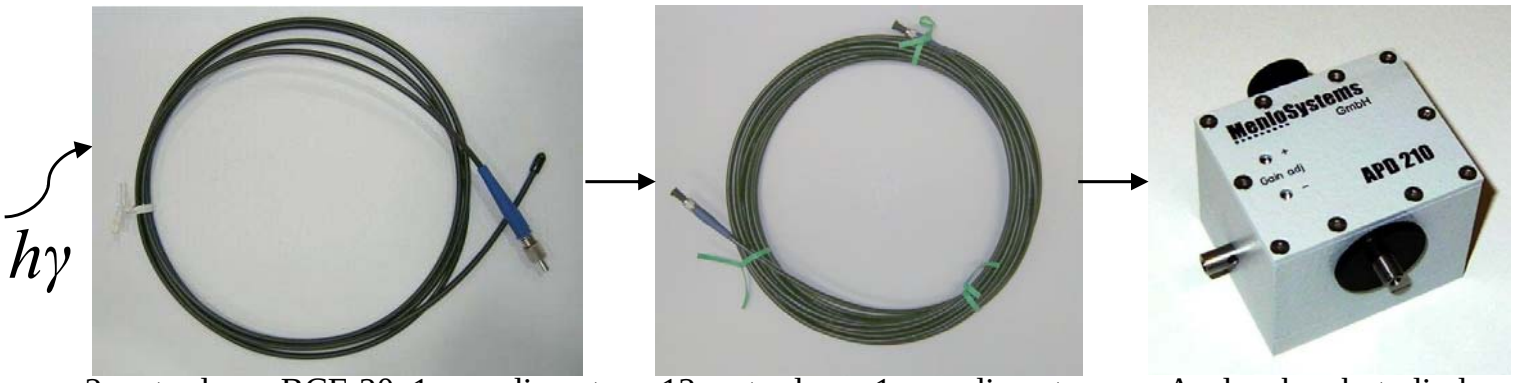
Scintillating fiber channel #0

Feb. 6, 2008

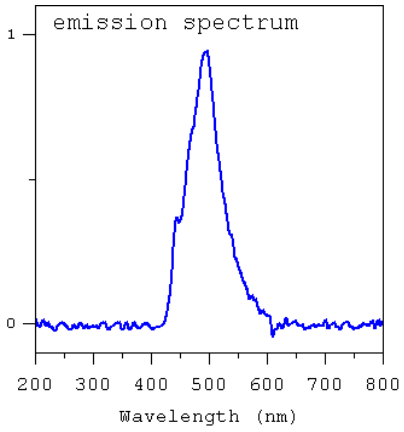


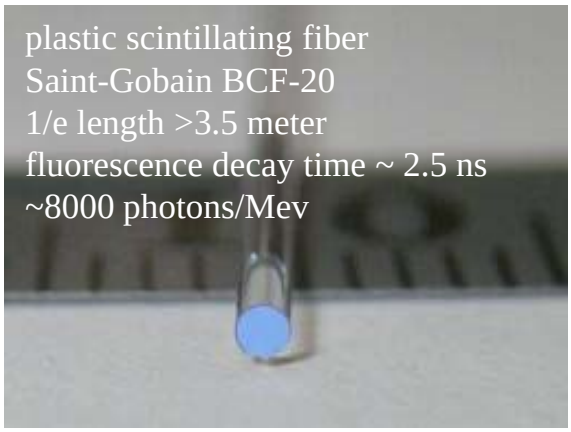


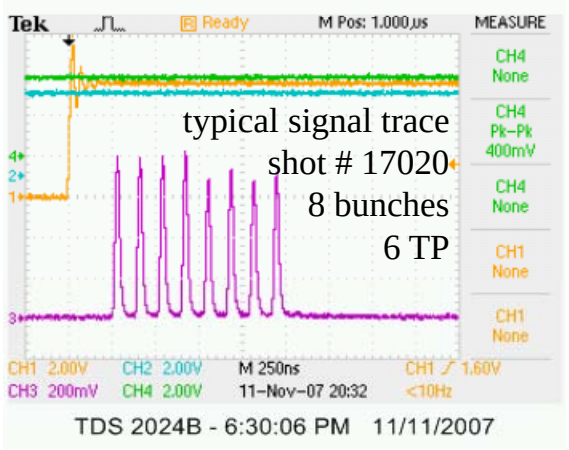
2 meter long, BCF-20, 1-mm diameter blue emitting scintillating fiber

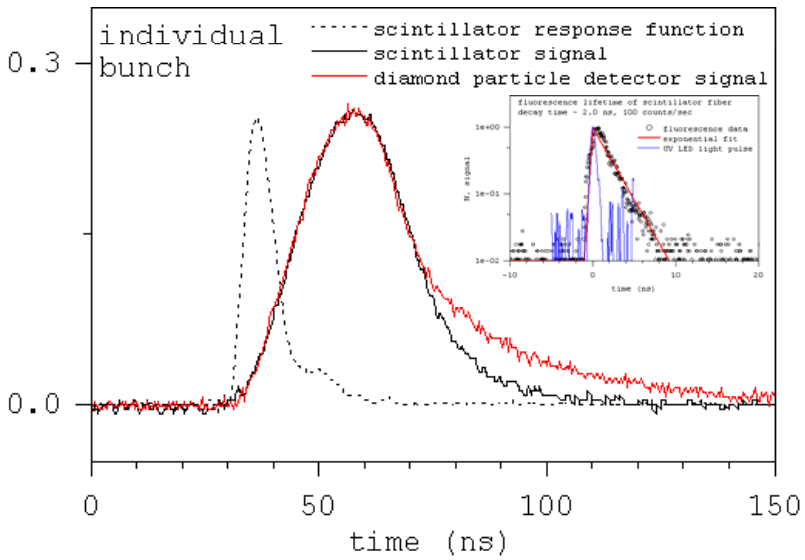
12 meter long, 1-mm diameter BFH37-1000 fiber, blue T=0.77

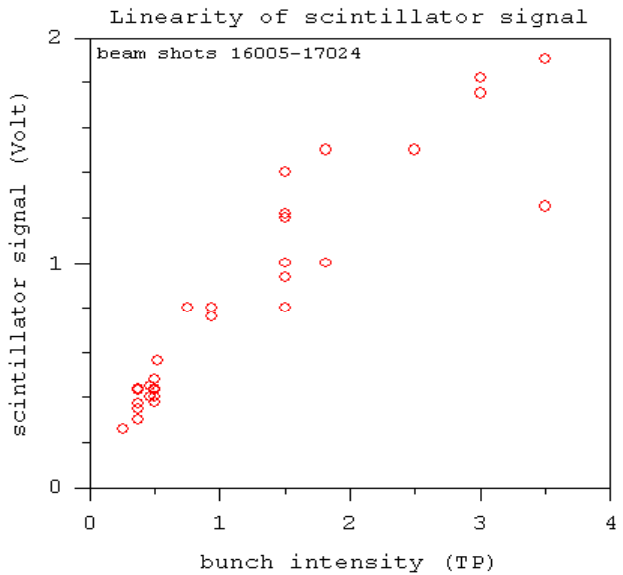
Avalanche photodiode



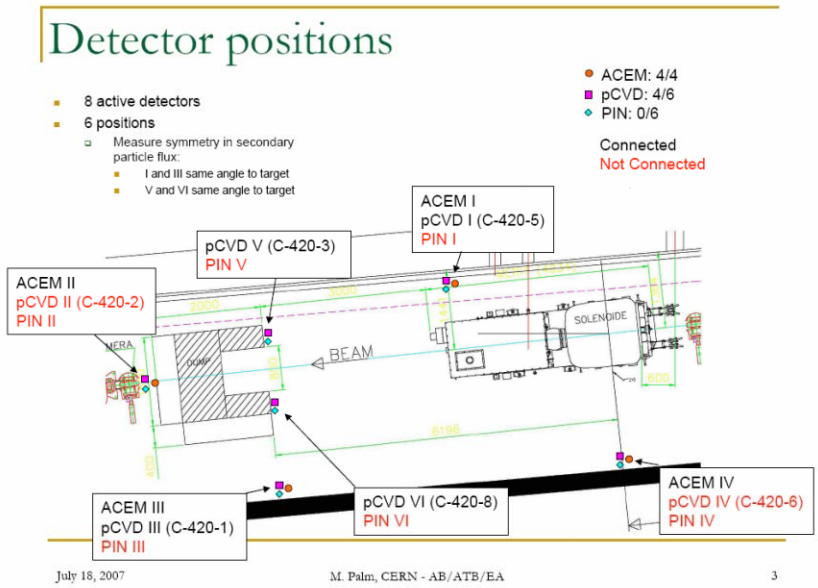


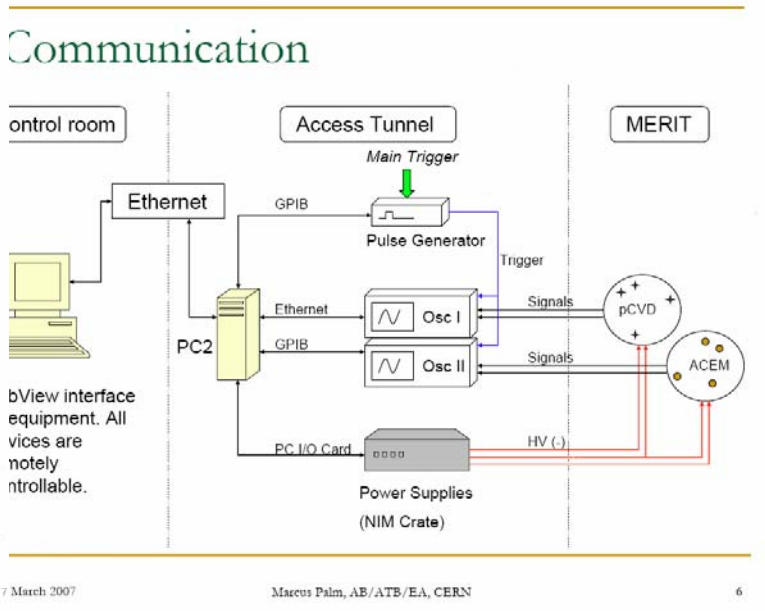






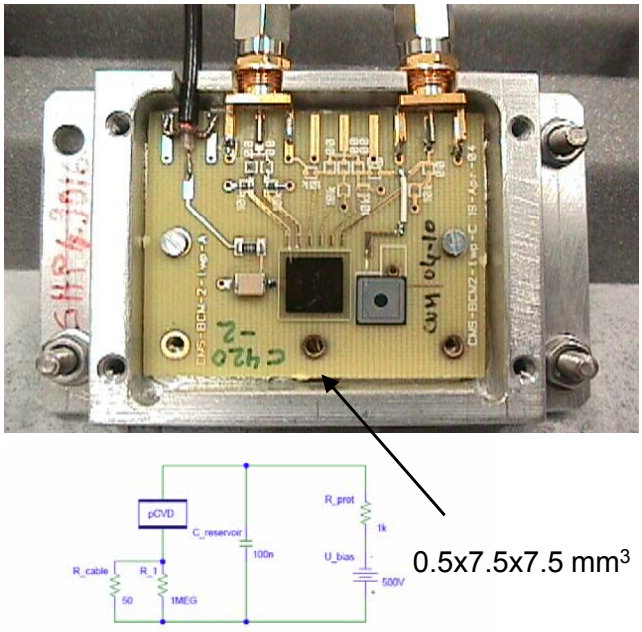
Diamond particle detectors



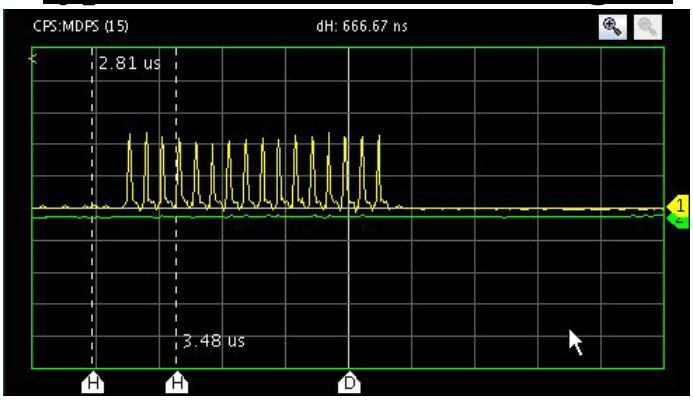


M. Palm Thesis:

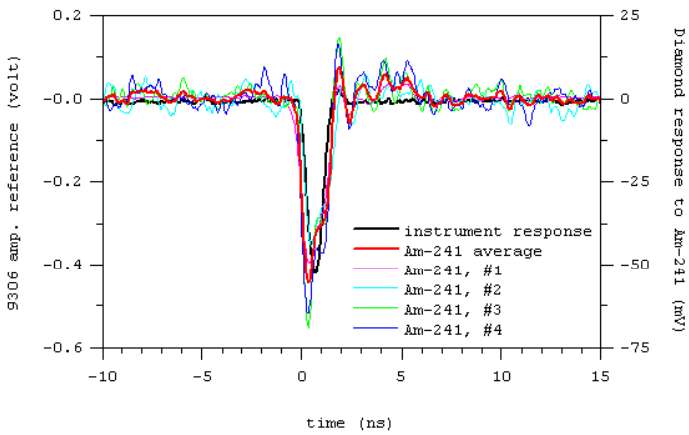
http://www.hep.princeton.edu/~mcdonald/mumu/target/Palm/MPalm_AB_note.pdf



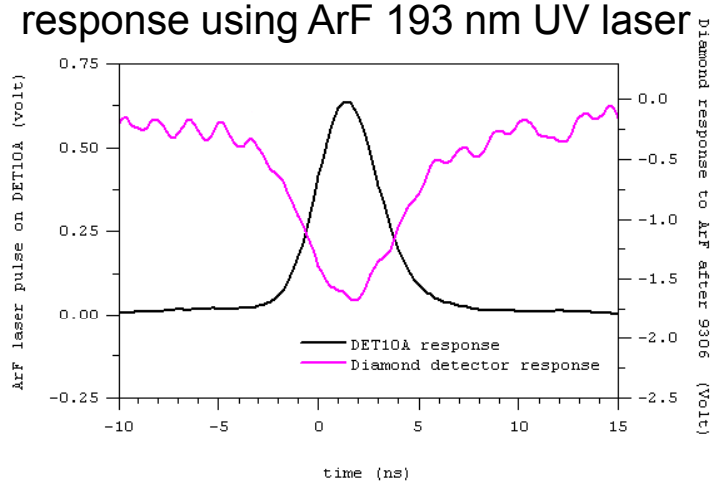
typical diamond detector signal



response with α source Am-241



response using ArF 193 nm UV laser



Correlation of scintillator & diamond particle detector signal

Nov 4 2009

Nov. 11, 2007, 17000 series data

Red: x, diamond particle detector signal @ left 20°

Black: y, scintillator detector signal

diamond left 20°

calculated correlation of peak height

$$Correl(X,Y) = \frac{\sum (x-\bar{x})(y-\bar{y})}{\sqrt{\sum (x-\bar{x})^2 \sum (y-\bar{y})^2}}$$