Scintillating Fiber Analysis of Secondary Particle Production

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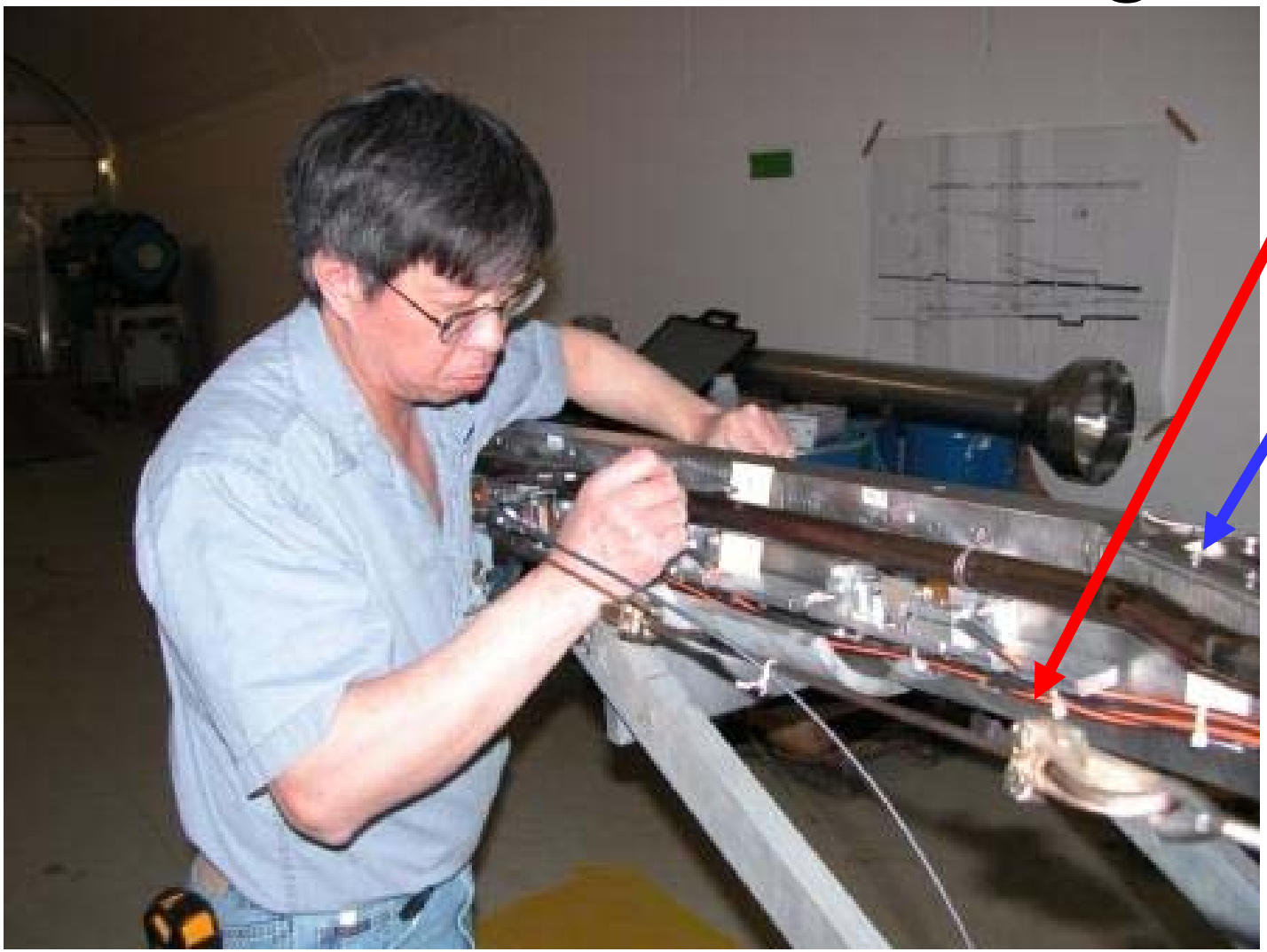
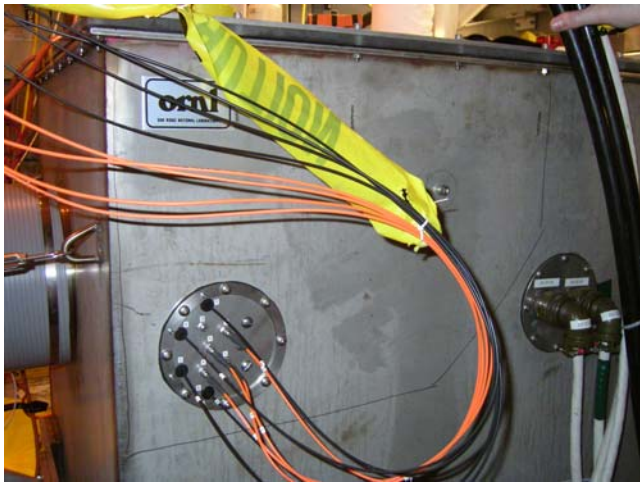
The Scintillating Fiber



Scintillating fiber along the primary vessel

Ti beam-exit window

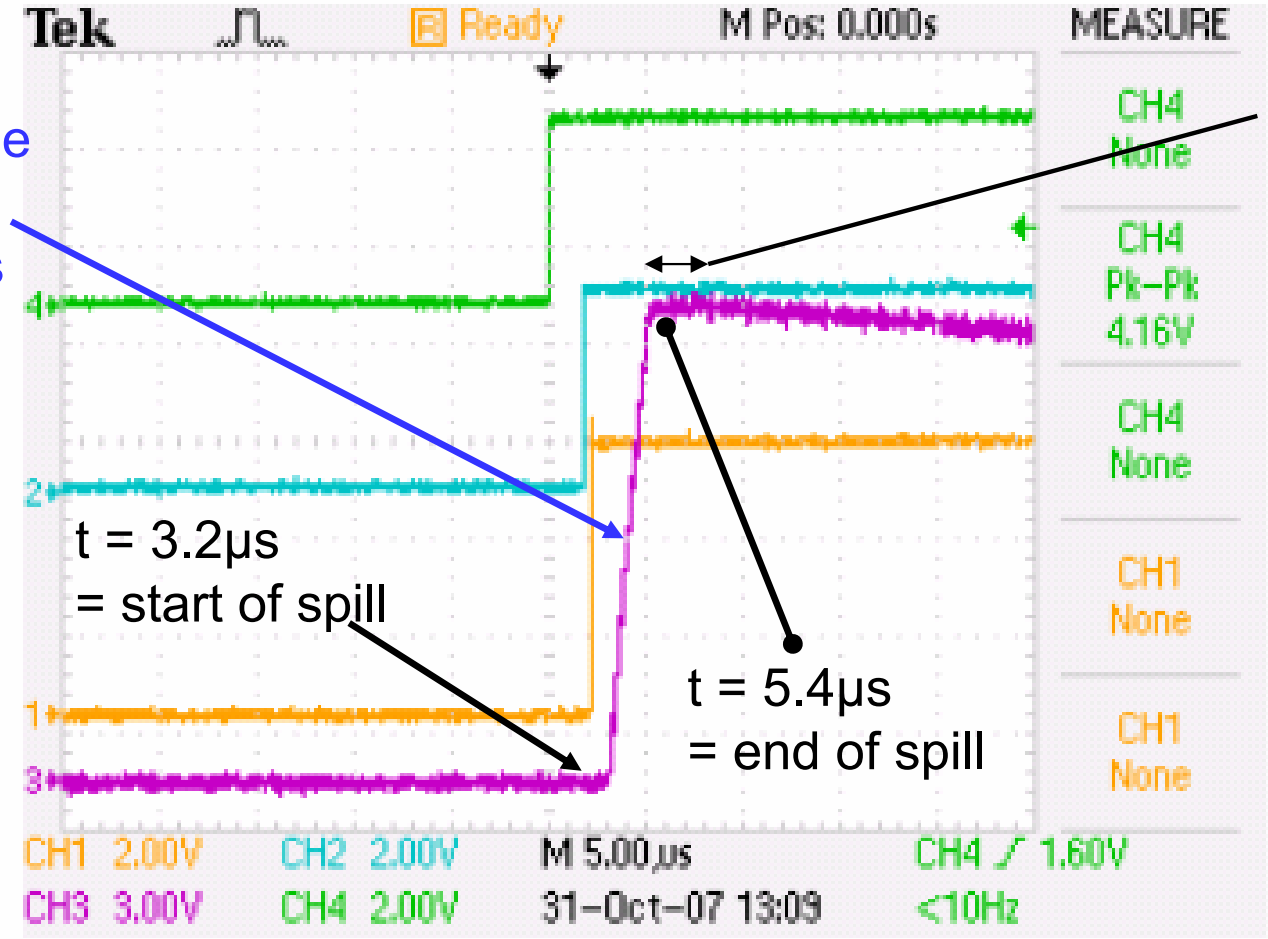


The scintillating fiber ended at the optics patch panel on the side of the mercury secondary containment vessel

The Waveforms

Scope input with 1 MΩ termination, ⇒ signal was integrated

"Staircase" due to integration of 16 bunches 131 ns apart

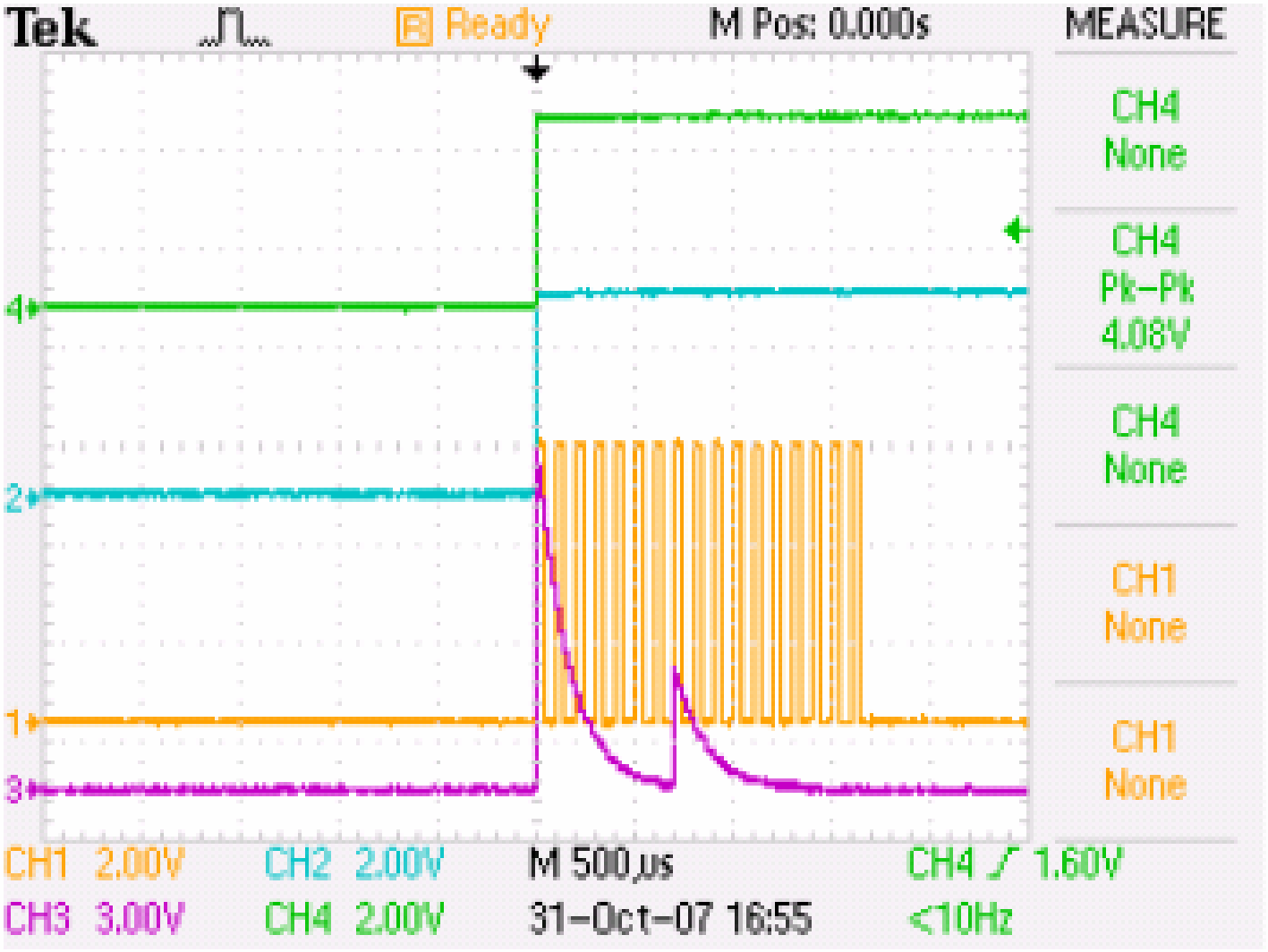


Average waveform from 5.5μs to 7.5μs to estimate the signal size

2000-point digitized waveform available

Pump/Probe 700μs Delay

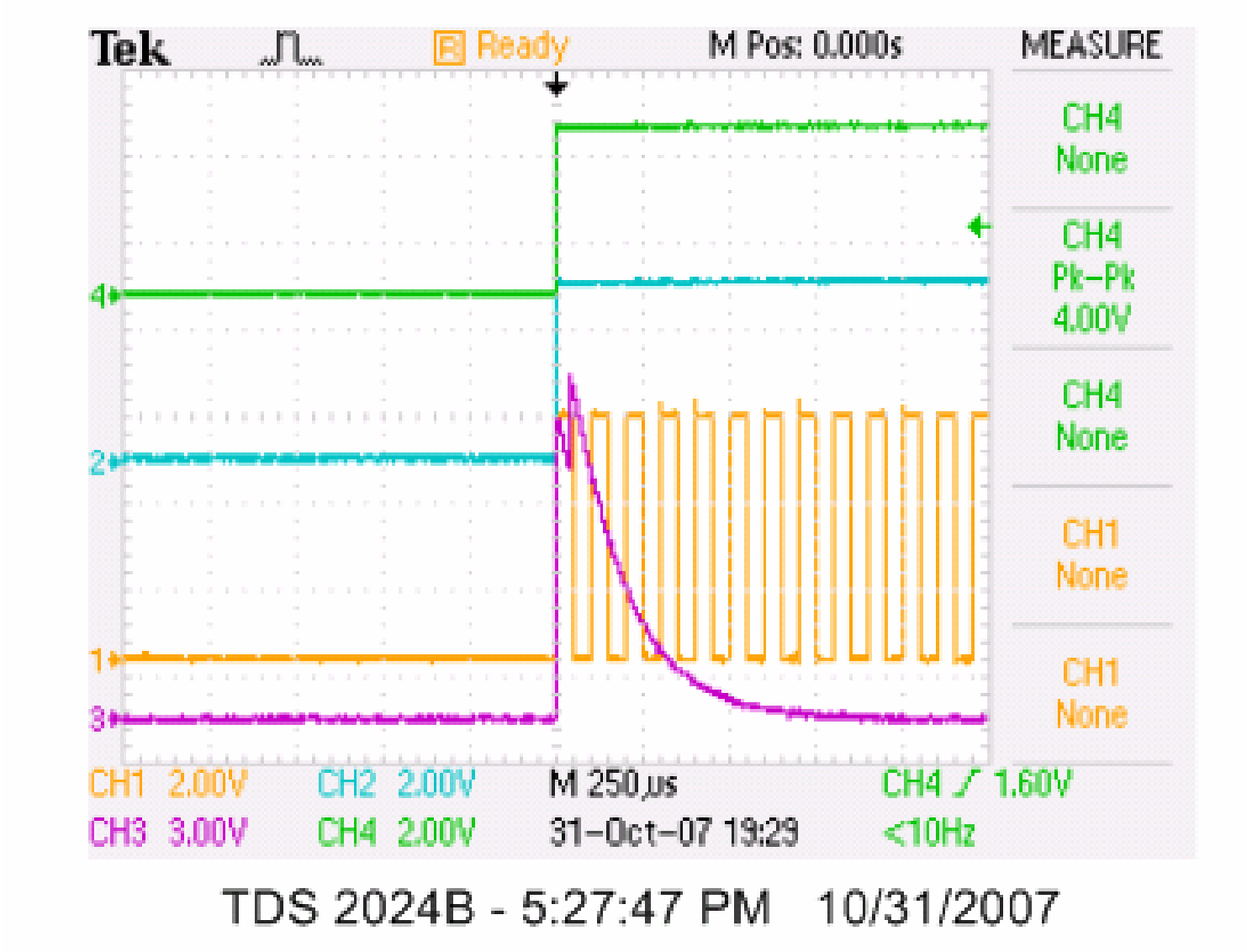
12 bunches in Pump, 4 bunches in Probe



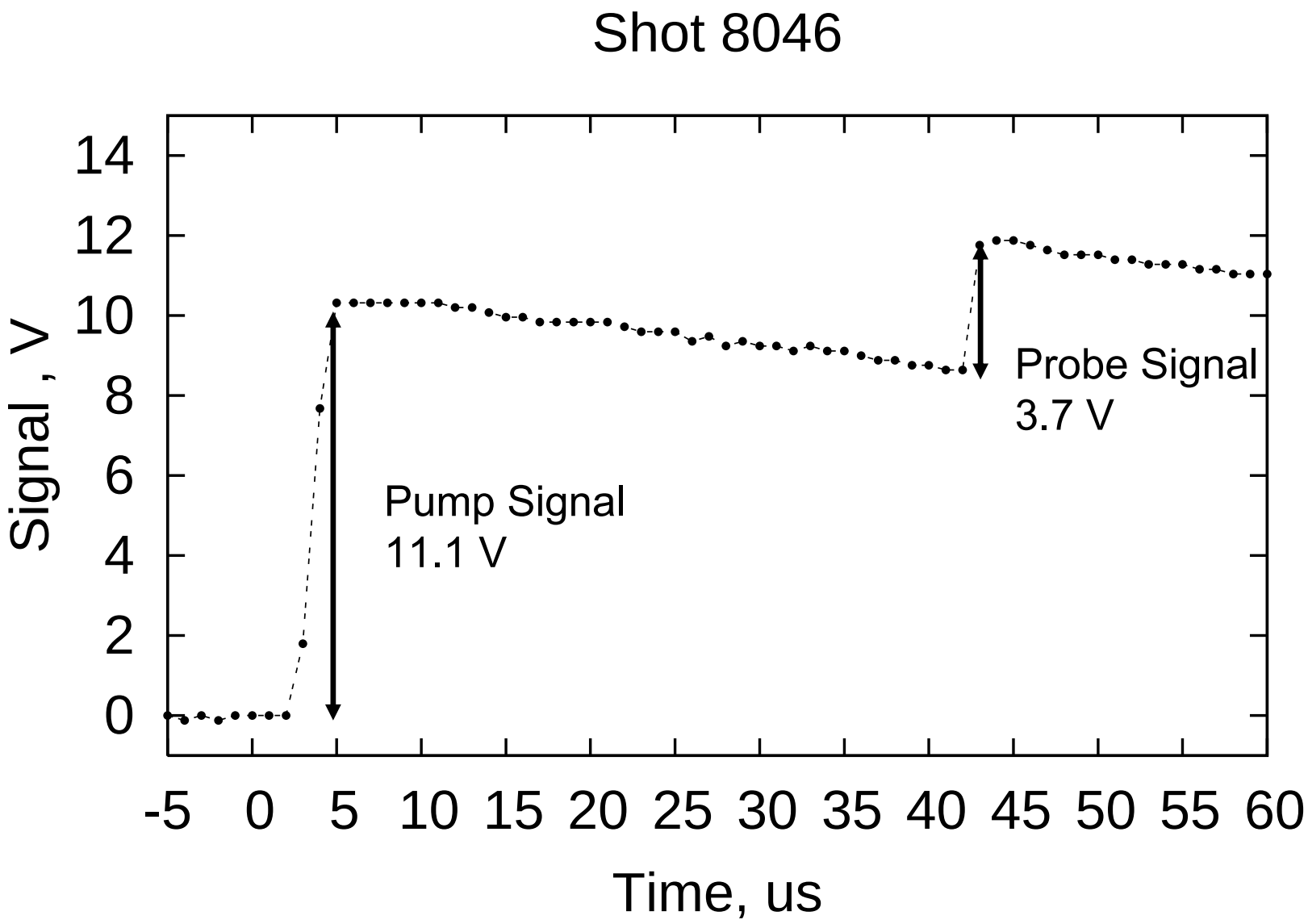
To a first approximation, the mercury jet was still an effective target 700μs after disruption by the "pump" protons

Pump/Probe 40µs Delay

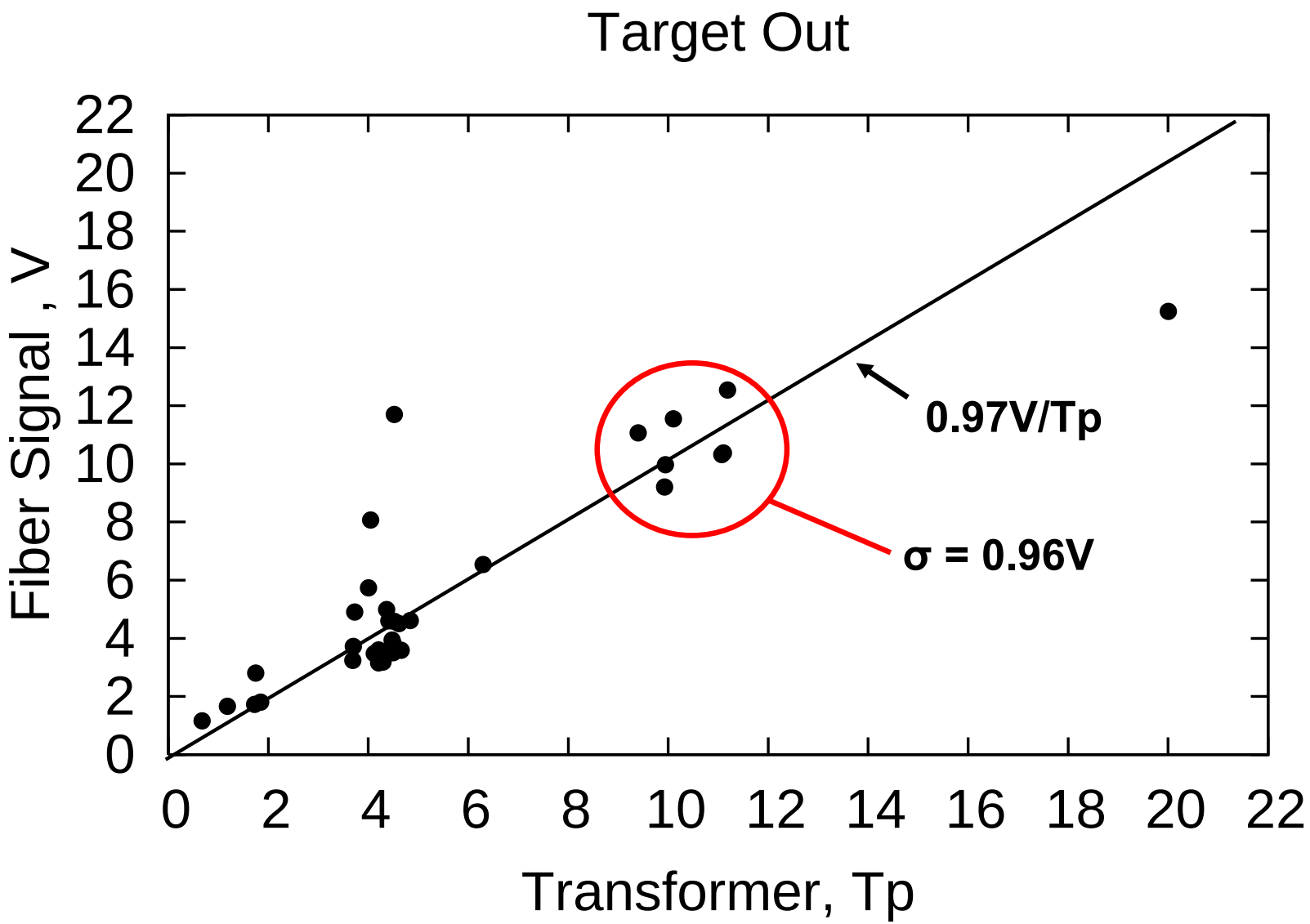
12 bunches in Pump, 4 bunches in Probe



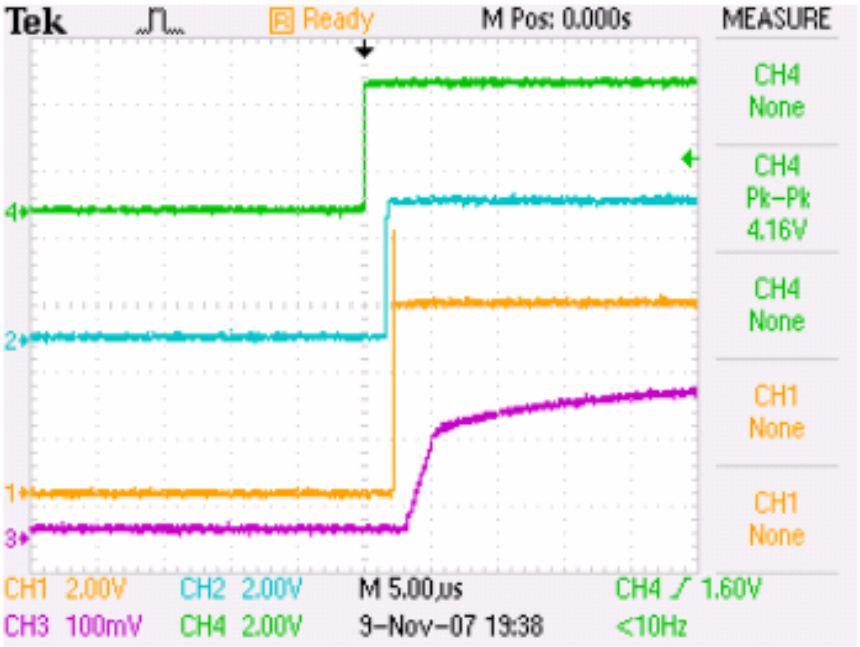
40µs Delay Detail



Target Out Analysis

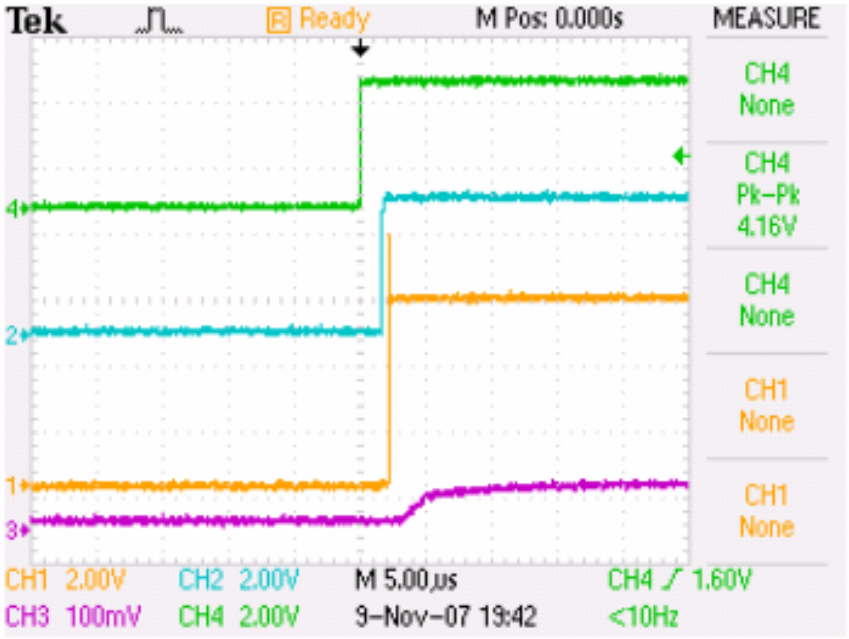


The 15000 Series (Day 15)



TDS 2024B - 5:35:30 PM 11/9/2007

Target In



TDS 2024B - 5:40:00 PM 11/9/2007

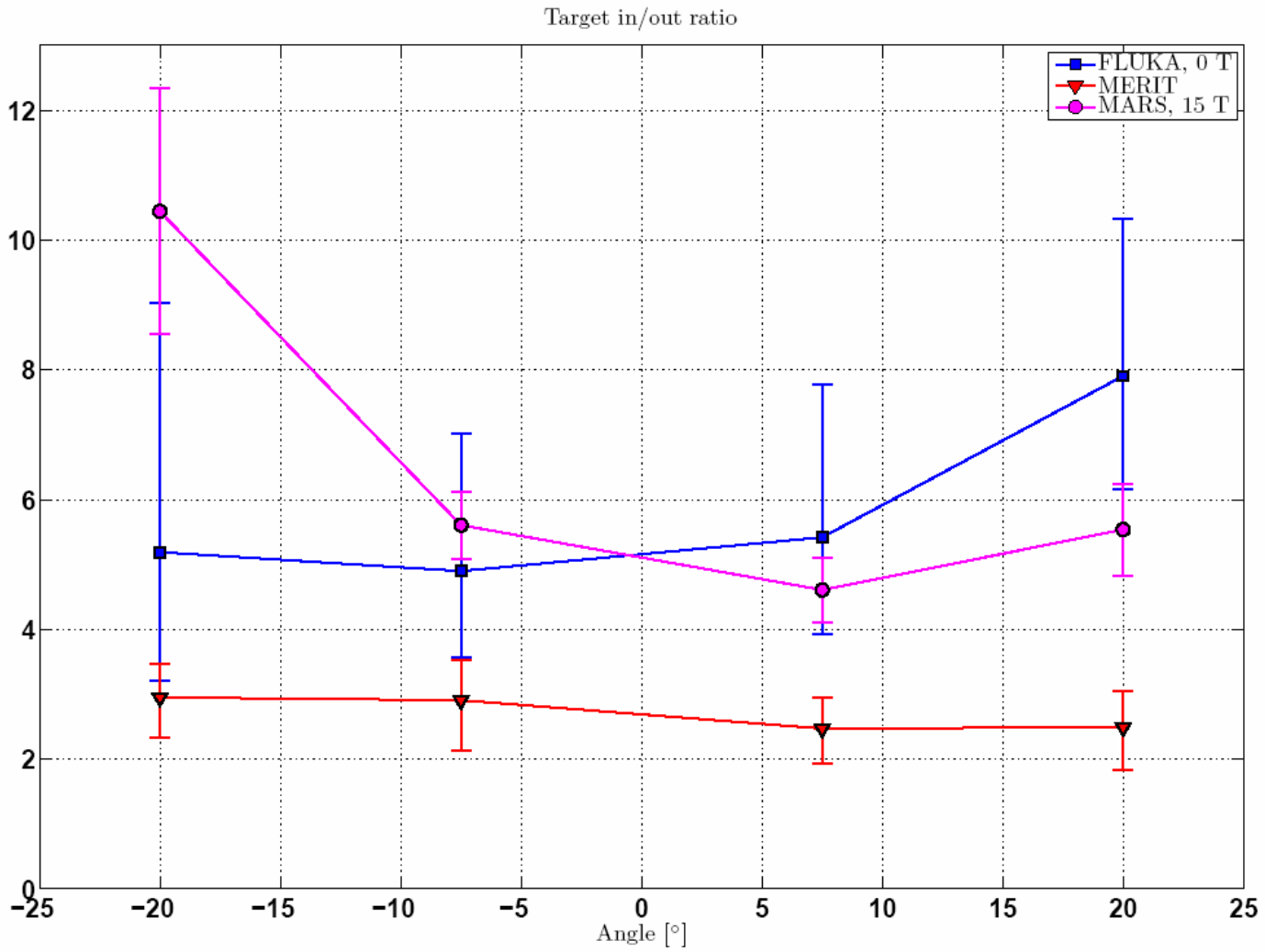
Target out

Optical Attenuation Installed—
Waveform amplitude sample reduced to 5.5-6.5µs

Target In/Out
Ratio = 3.8

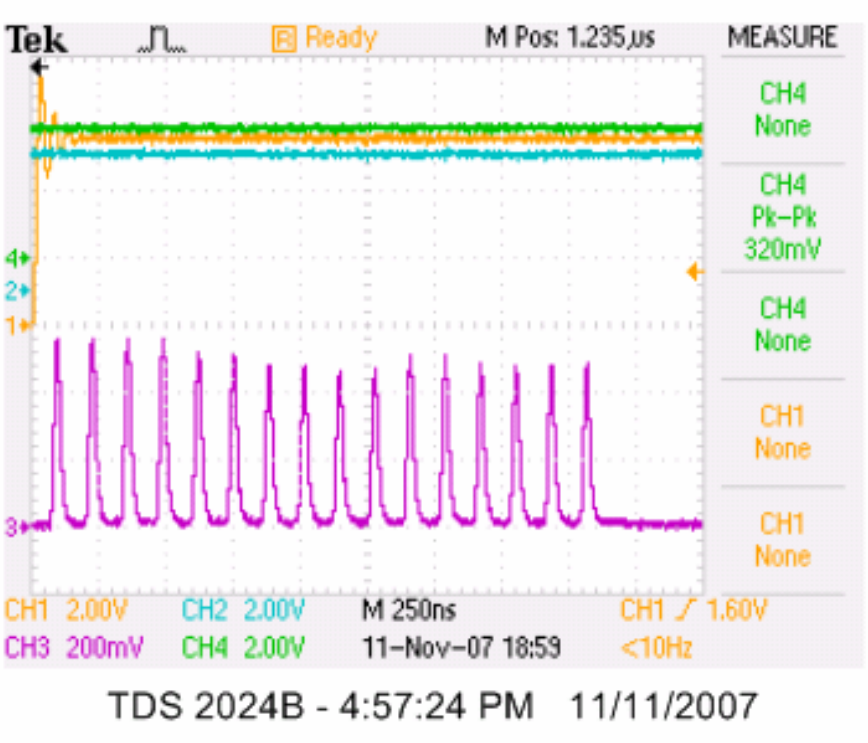
Target in/out ratio
from diamond secondary particle detectors

[M. Palm, Dec 19, 2007]

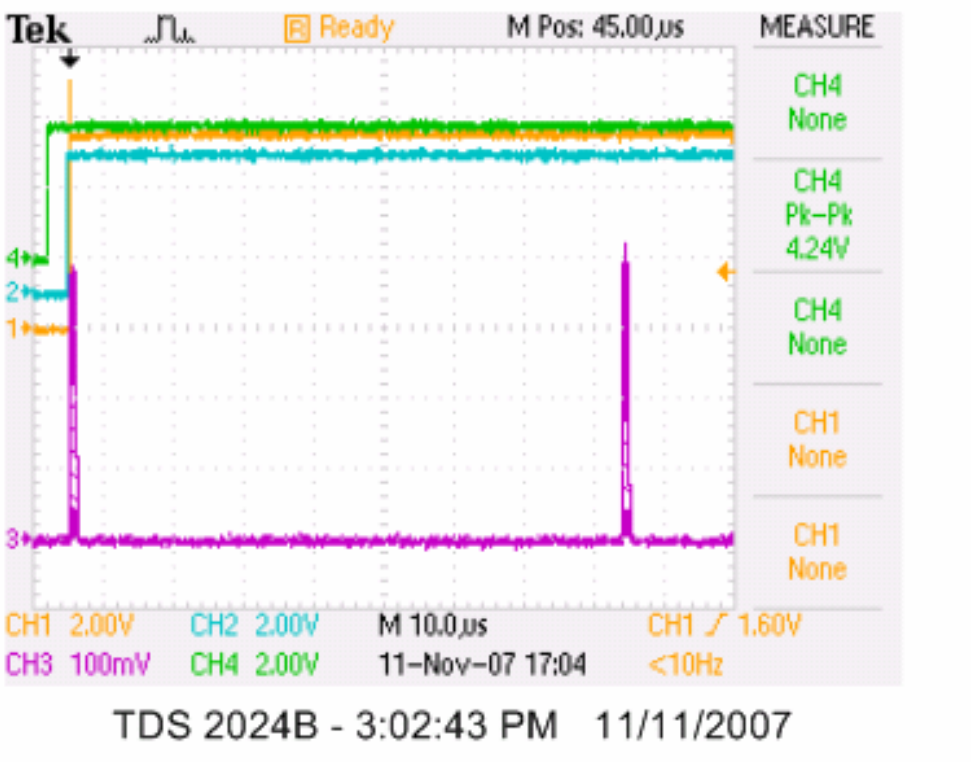


The 17000 Series

Scope input now terminated in 50Ω



No Delay
(single turn extraction)



Pump/Probe with 80µs Delay
(8 + 8 bunches)