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Welcome to the Heterodyne Velocimeter Workshop



July 20 and 21, 2006
Lawrence Livermore National Laboratory

This work was performed under the auspices of the U.S. Department of Energy by the University of California, Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48.

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There are a few things that we need to cover before we get started



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Many thanks to Leslie Johnson for taking care of details.

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Today's Agenda



Strand	Ted	LLNL	Intro, welcome, opening remarks	9:00 AM
Iverson	Adam	BN/LAO	PDV Packaging	9:20 AM
Marshall	Bruce	STL	Variations on PDV	9:40 AM
			Break	10:00 AM
Levinson	Scott	UT Austin	Determining Railgun Dynamics Using PDV	10:30 AM
Holtkamp	David	LANL	A Smorgasbord of Los Alamos Experiments	10:50 AM
DeVore	Doug	BN/STL	Probe topics	11:10 AM
Malone	Robert	BN/LAO	Optical modeling of VISAR and PDV probes	11:30 AM
			Lunch	11:50 AM
Jones	Scott	Sandia	Material response to pulsed radiation	2:00 PM
Roos	Ed	LLNL	Shock pressures in LiF, PMMA	2:20 PM
Rodriguez	George	LANL	Laser Ablation of a Metal Layer on Glass	2:40 PM
Valenzuela	Anthony	LANL	Laser Ablation, Part 2	3:00 PM
			Break	3:20 PM
Dolan	Daniel	Sandia	Using PDV with windowed samples	3:50 PM
Jensen	Brian	LANL	Window characterization	4:10 PM
Strand	Ted	LLNL	Discussions	4:30 PM
			End of day	5:00 PM

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Tomorrow's Agenda



Strand	Ted	LLNL	Opening remarks	8:50 AM
Ambrose	Pat	LLNL	Assessing beat amplitudes preshot	9:00 AM
Krauter	Kerry	LLNL	Implementing beat amplitude measurements	9:20 AM
Rutkowski	Mike	BN/LAO	PDV Detector Characterization and Testing	9:40 AM
			Break	10:00 AM
Furlanetto	Mike	LANL	Data analysis Methods	10:30 AM
Palakkal	Ashok	LLNL	Data analysis and EOS results	10:50 AM
Kuhlow	Bill	BN/NLV	Data analysis using FT method	11:10 AM
Strand	Ted	LLNL	Limitations of FT method	11:30 AM
Strand	Ted	LLNL	Discussions	11:50 AM
			End of workshop	12:00 PM

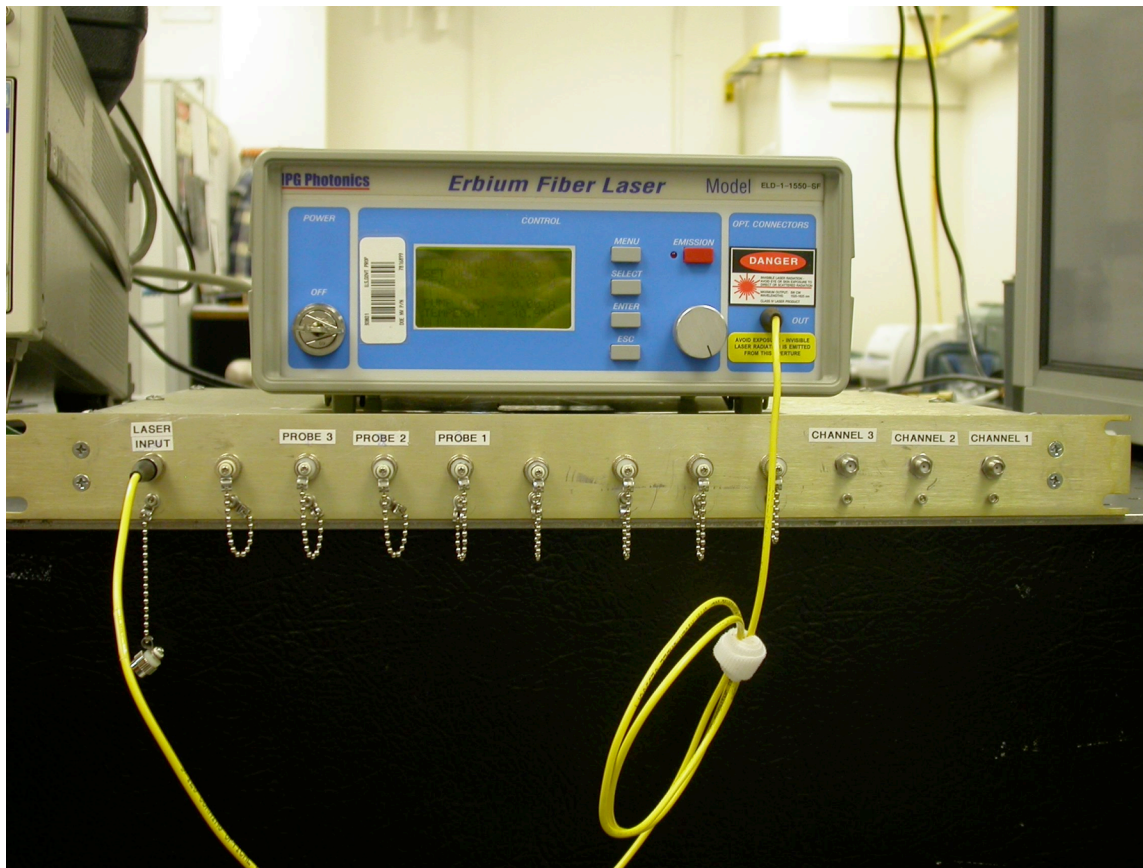
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But first.....some baby pictures!!



Our 1st shot with the PDV was at the BEEF bunker (NTS) on March 10, 2003.



1 W laser

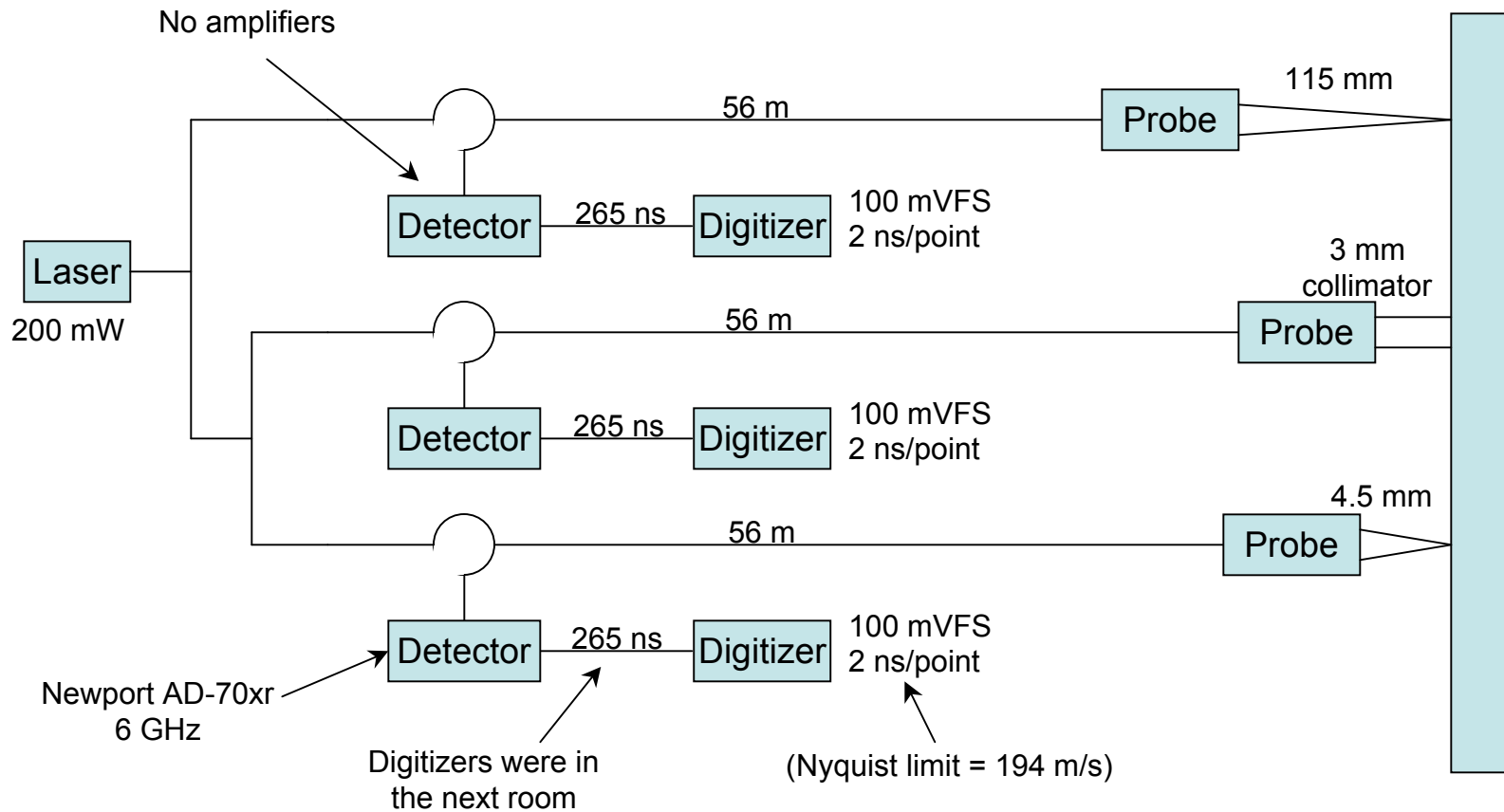
3 channels
(no knobs!)

We borrowed
digitizer channels
from the bunker

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We fielded 3 different types of probes

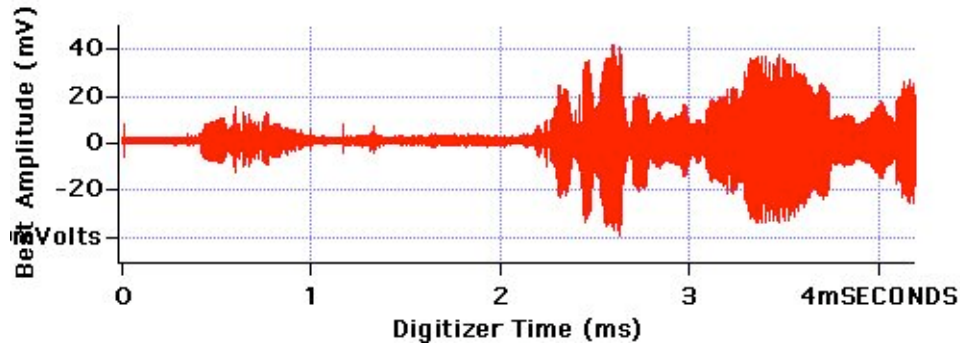


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The data was less than perfect.....

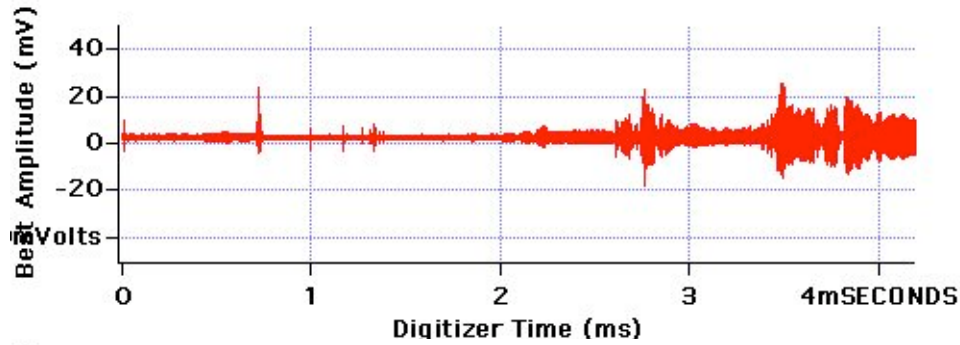


Probe 1
115 mm



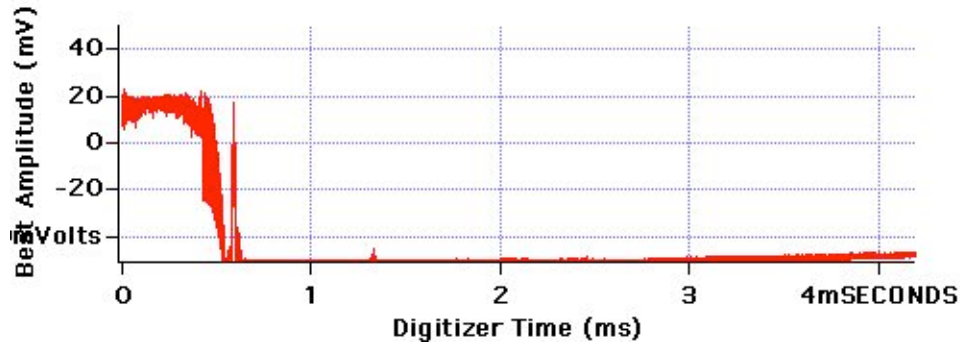
Looks good!

Probe 2
3 mm
collimator



Anything here??

Probe 3
4.5 mm

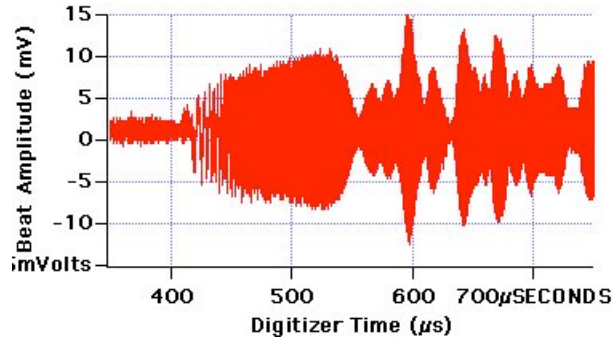


Electrical noise here

But at least we got something!

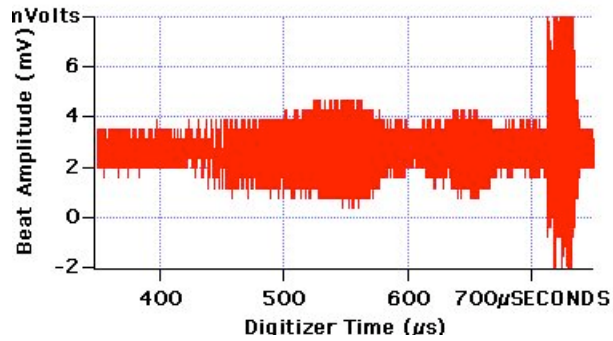


Probe 1
115 mm



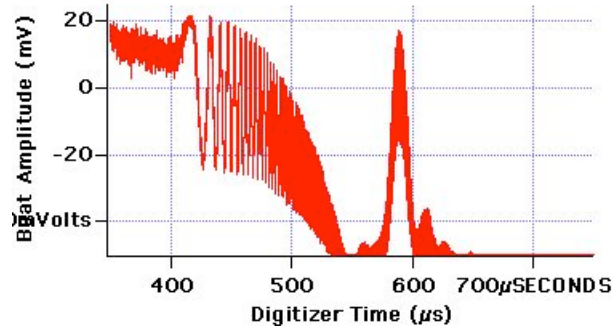
Still looks good!

Probe 2
3 mm
collimator



Still not sure

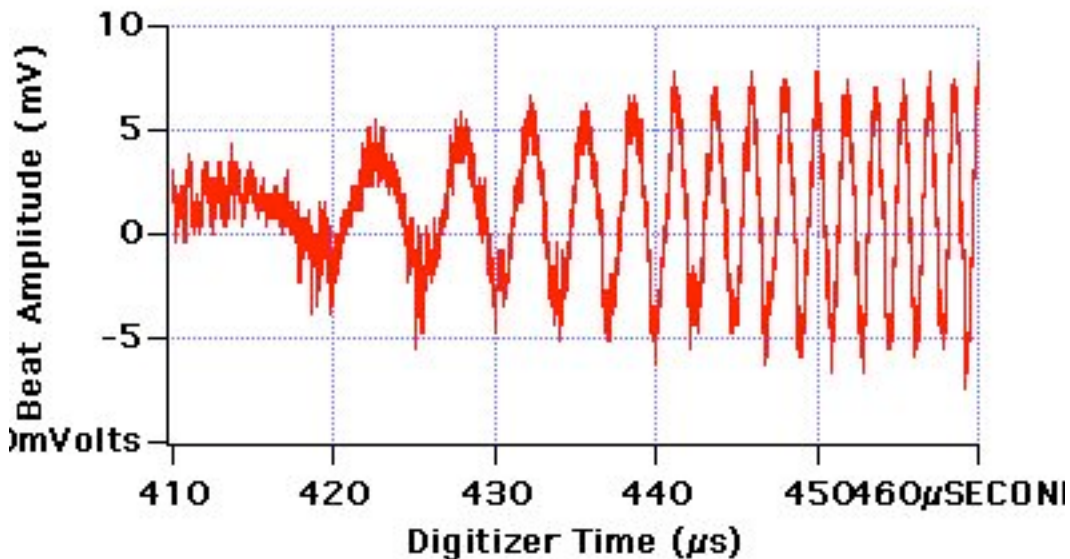
Probe 3
4.5 mm



Definitely have some data!

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I did the 1st analysis via peak finding using Excel spreadsheets



Excel can handle only 50,000 rows of data, so I needed to split the data file among 10 spreadsheets.

I applied different amounts of smoothing until I found only 1 peak per half cycle.

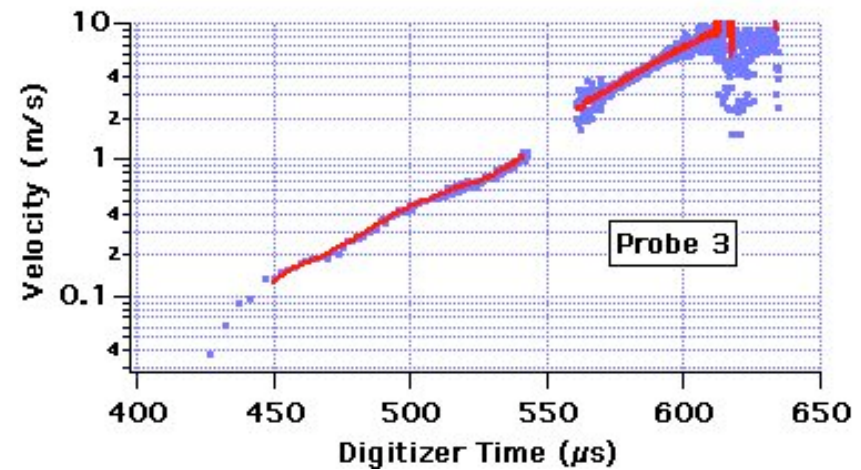
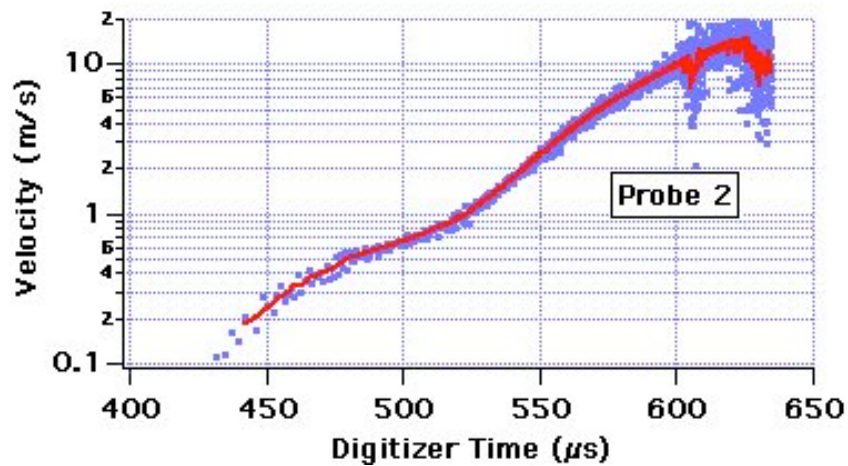
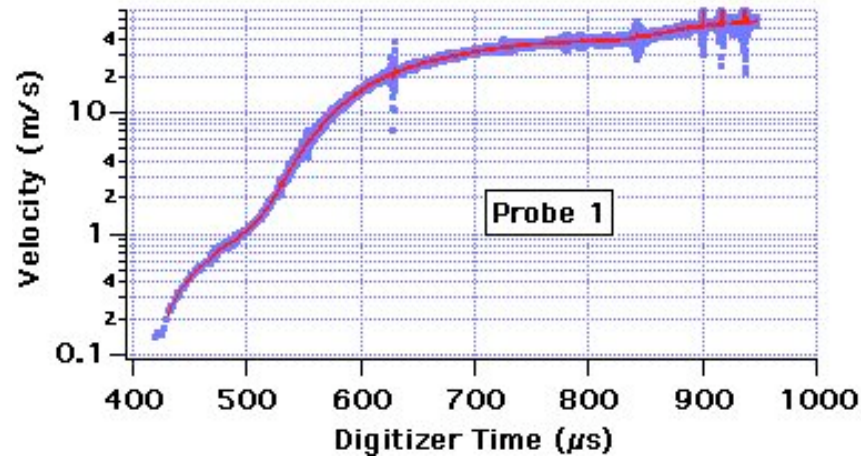
Then I gathered up all the times at which the peaks occurred, and calculated the velocity averaged over the half cycles.

This took about 2 days per probe.

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Not too bad for our 1st try....



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