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Lethality, Survivability, Mobility and Sustainment for America's Army

Advanced Light Combat Vehicle Armament (ALACV) Air Bursting Munition

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Briefing Agenda

- Objectives
- Demonstration Vehicle Constraints
- Case Length Determinations/Mann Barrel Interface
- Body Sleeve
- Baseline Body Design Analysis
- Fuze

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Objectives

- Develop a cartridge that will burst at a pre-determined location
- Show an increase in lethal area of 400% when compared to a 30 x 173 HEI projectile with a PD fuze

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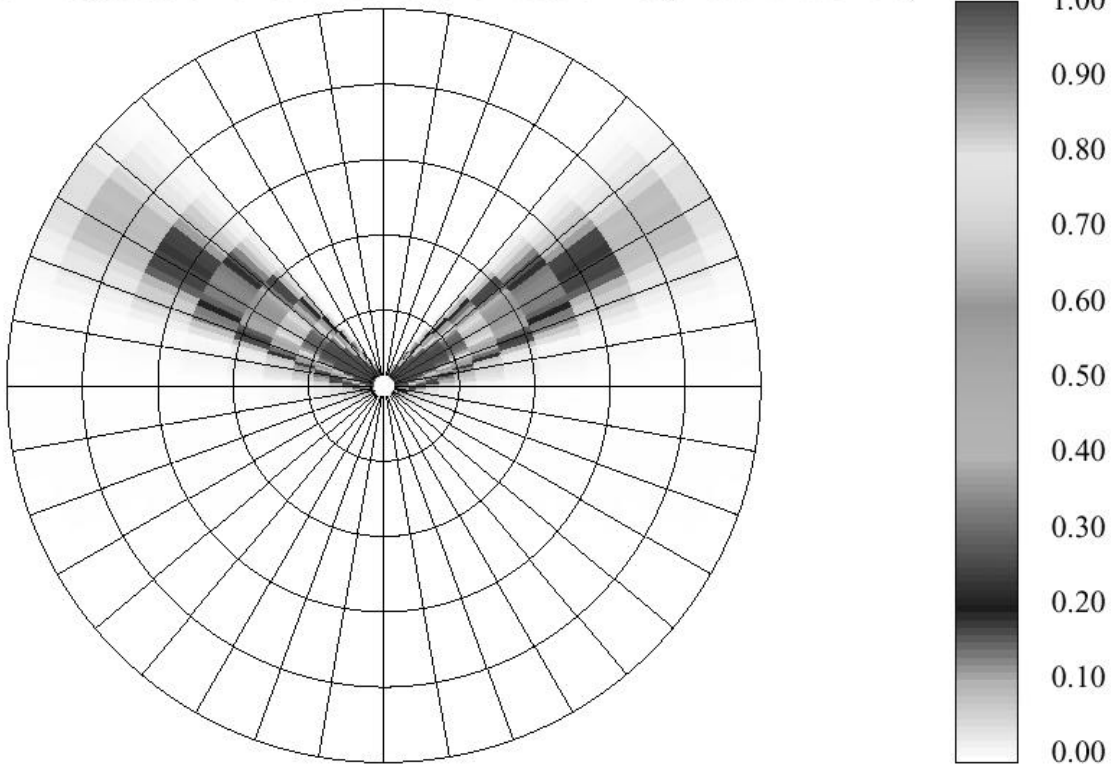
PROBABILITY OF INCAPACITATION GIVEN A BURST

Warhead: Generic 30mm

Range: 1000 m - Burst Height: 0.00 ft

Prone Target - Incapacitation Criterion: 30 Second Assault - Body Part: Whole Body



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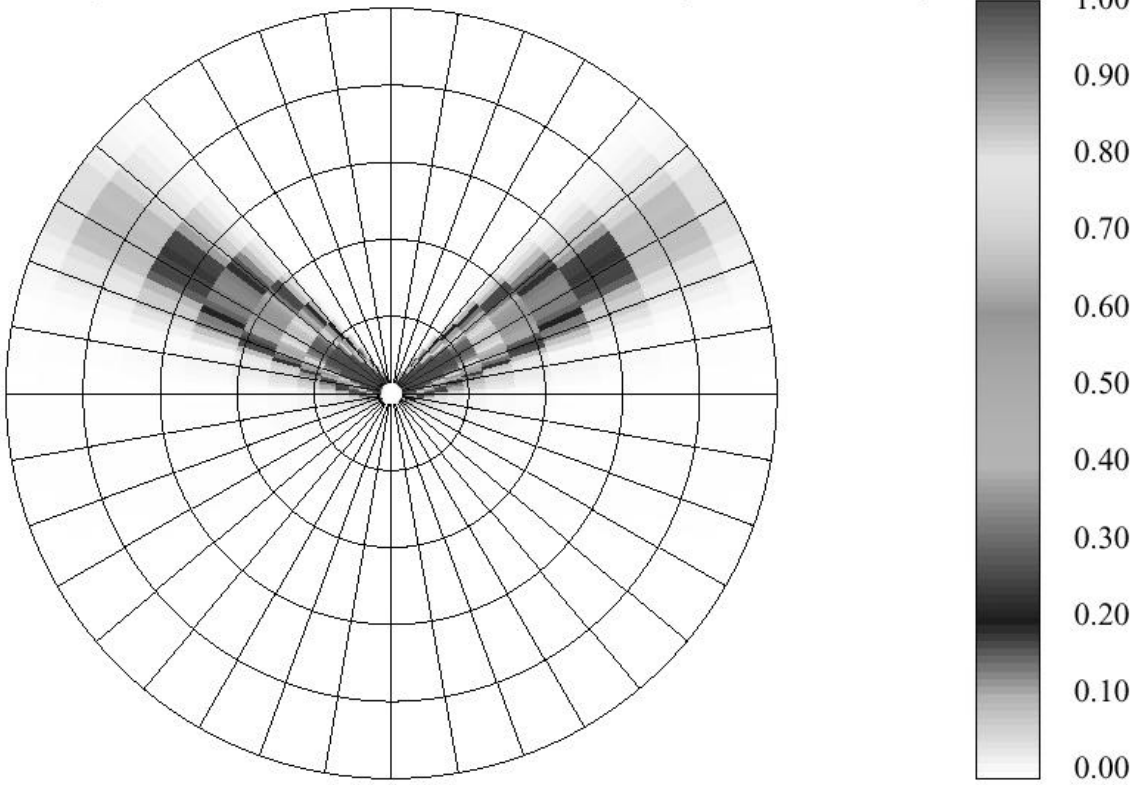

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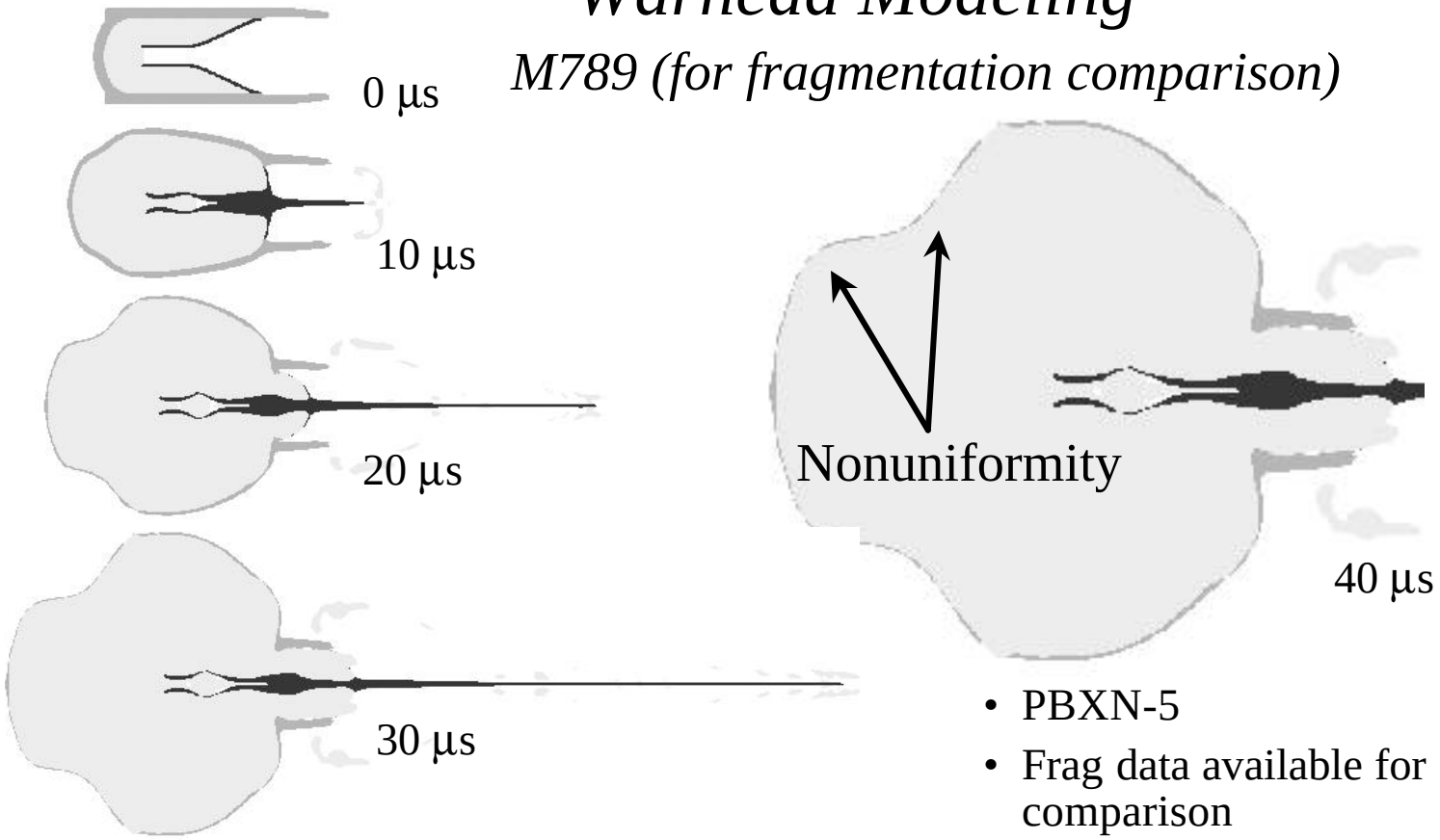
Warhead Modeling

M789 (for fragmentation comparison)



- PBXN-5
- Frag data available for comparison

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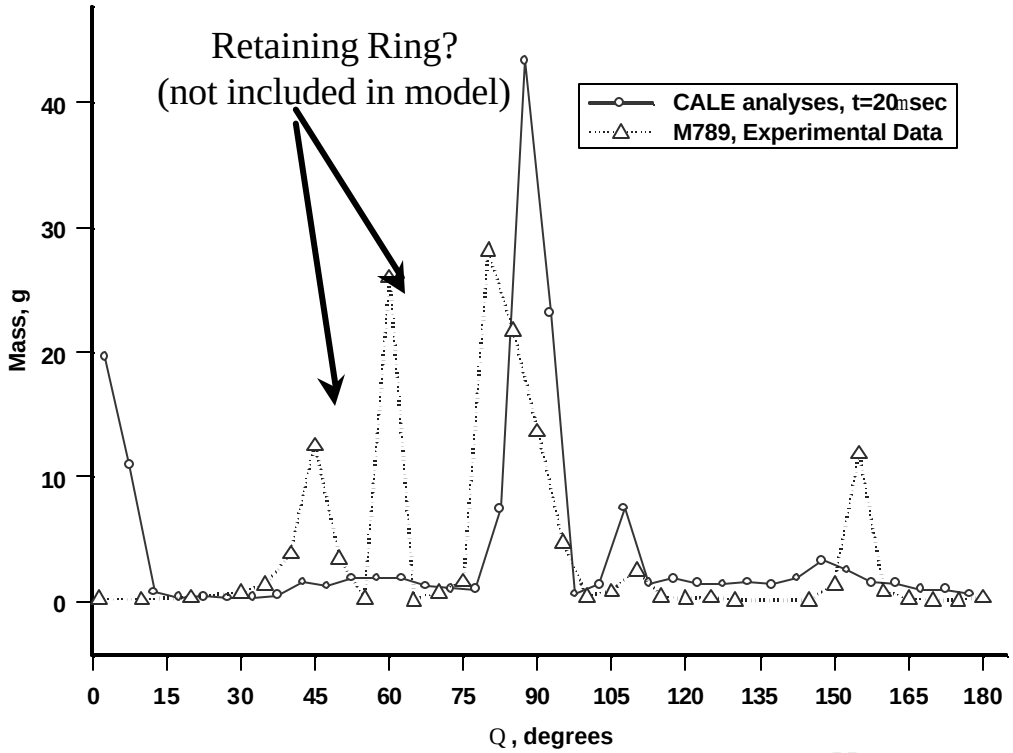
M789 fragmentation comparison



Excellent Agreement!

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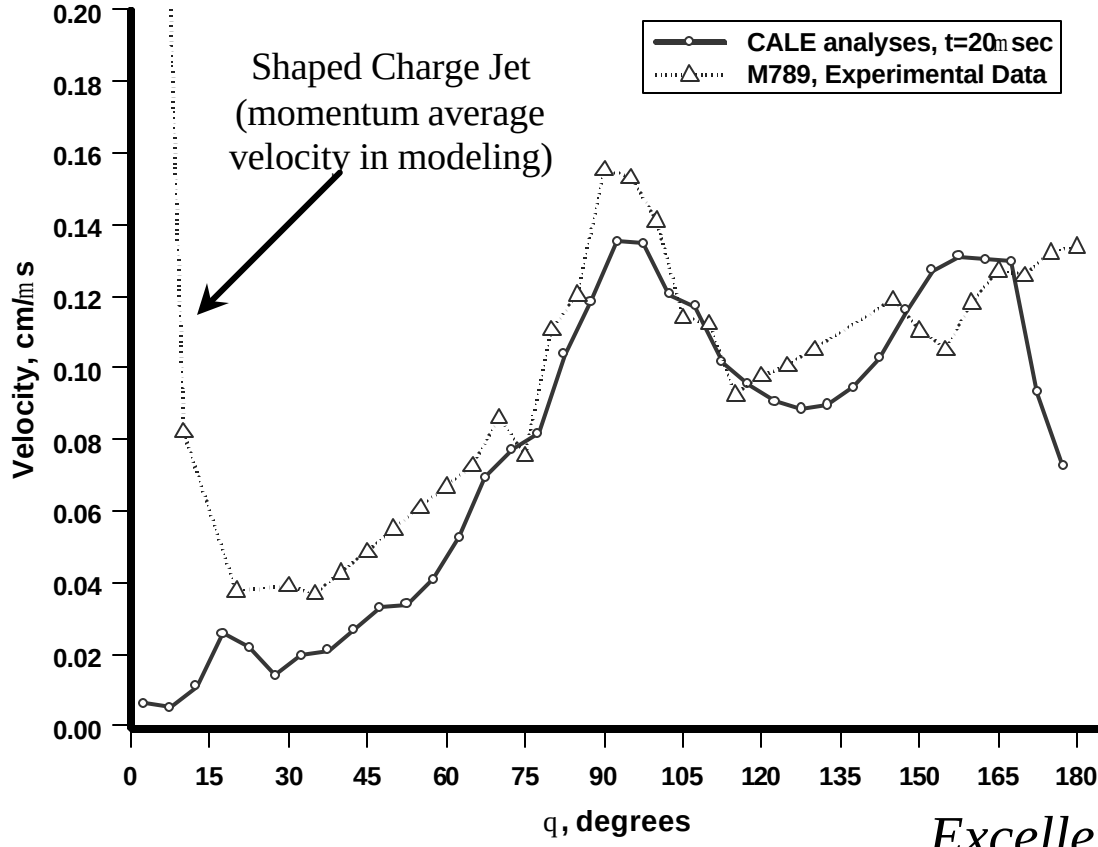
M789 fragmentation comparison



Excellent Agreement!

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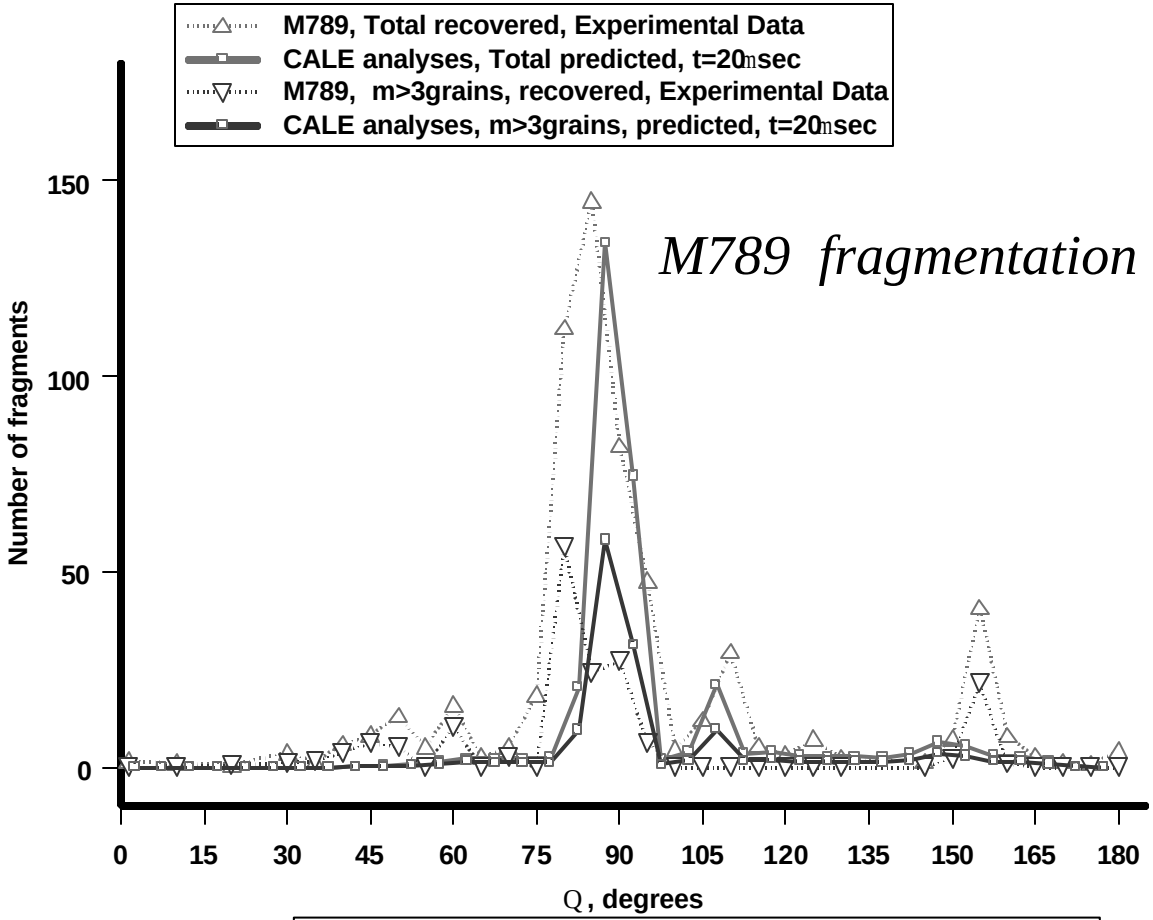

M789 fragmentation comparison

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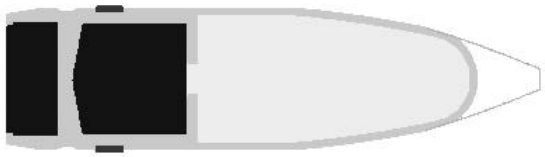
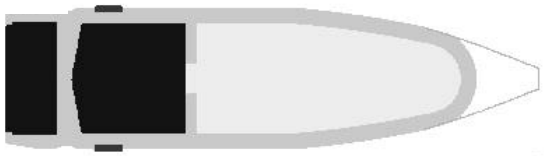
Preliminary Baseline
Base Fuzed

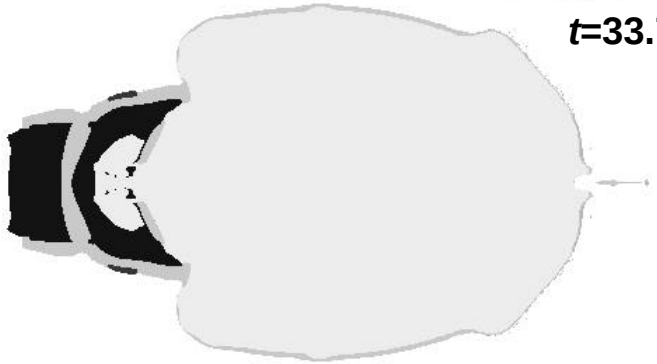


***t*=11.2% (0.0885 in)**



***t*=22.5% (0.1770 in)**

***t*=33.7% (0.2655 in)**



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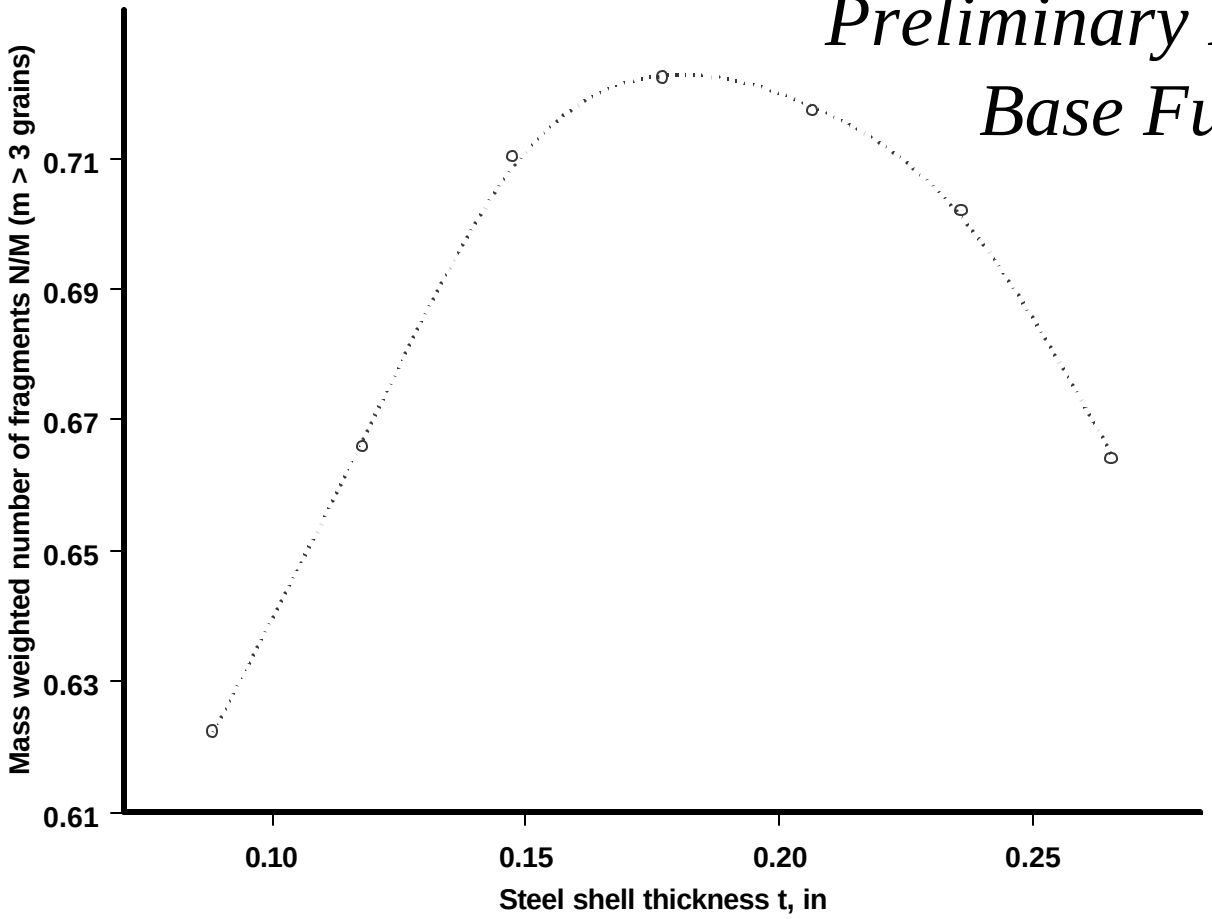
Preliminary Baseline Base Fuzed



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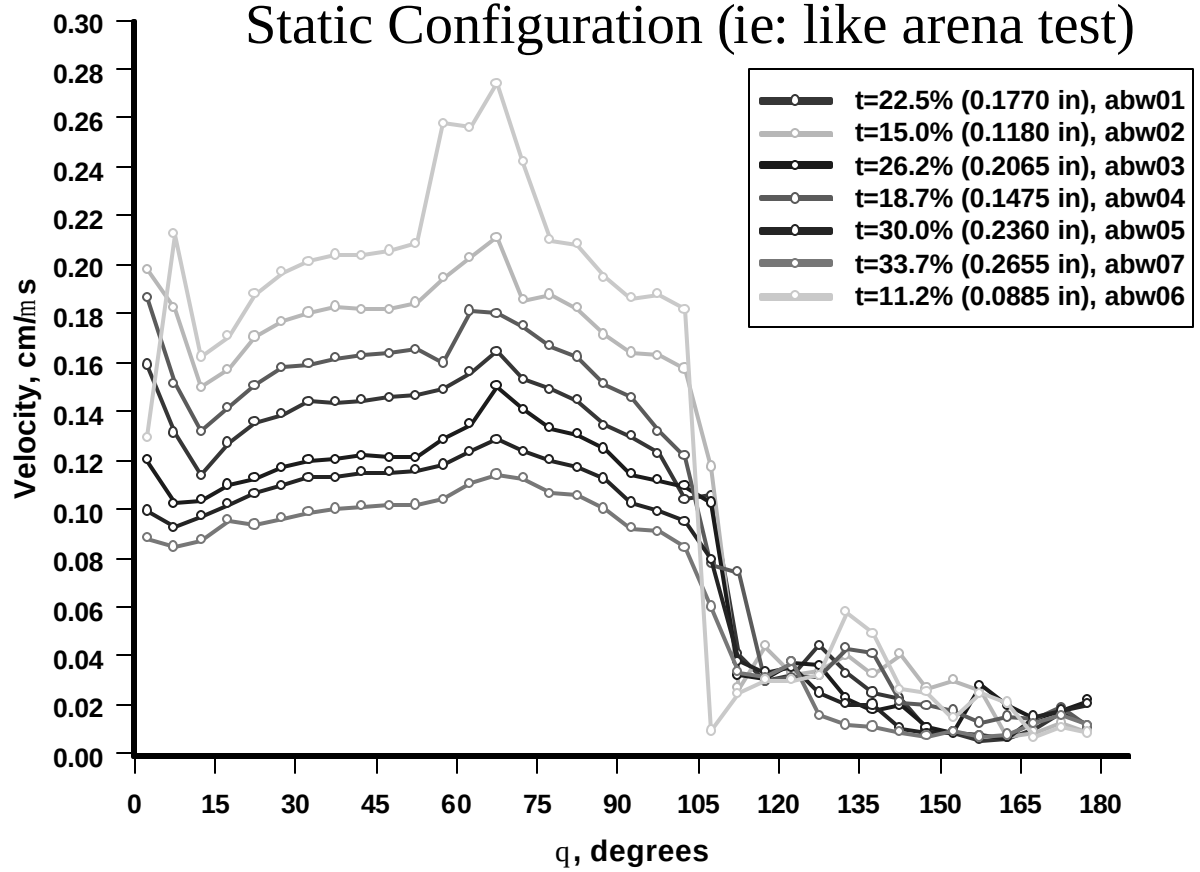
Static Configuration (ie: like arena test)



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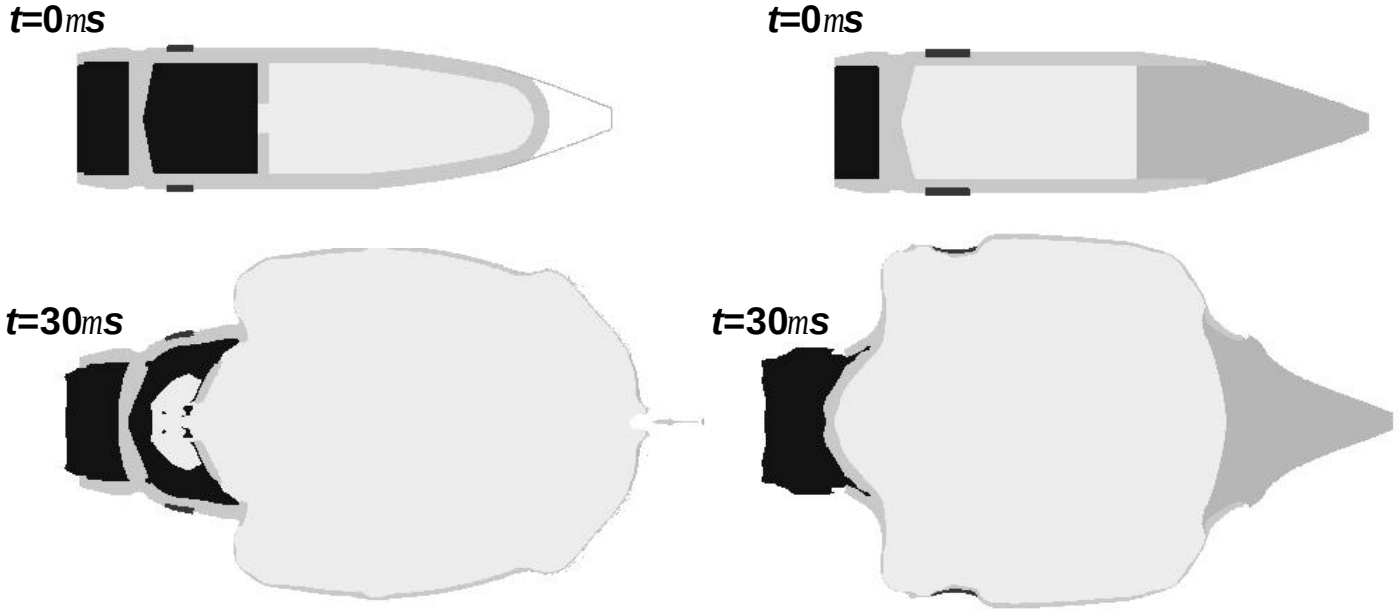
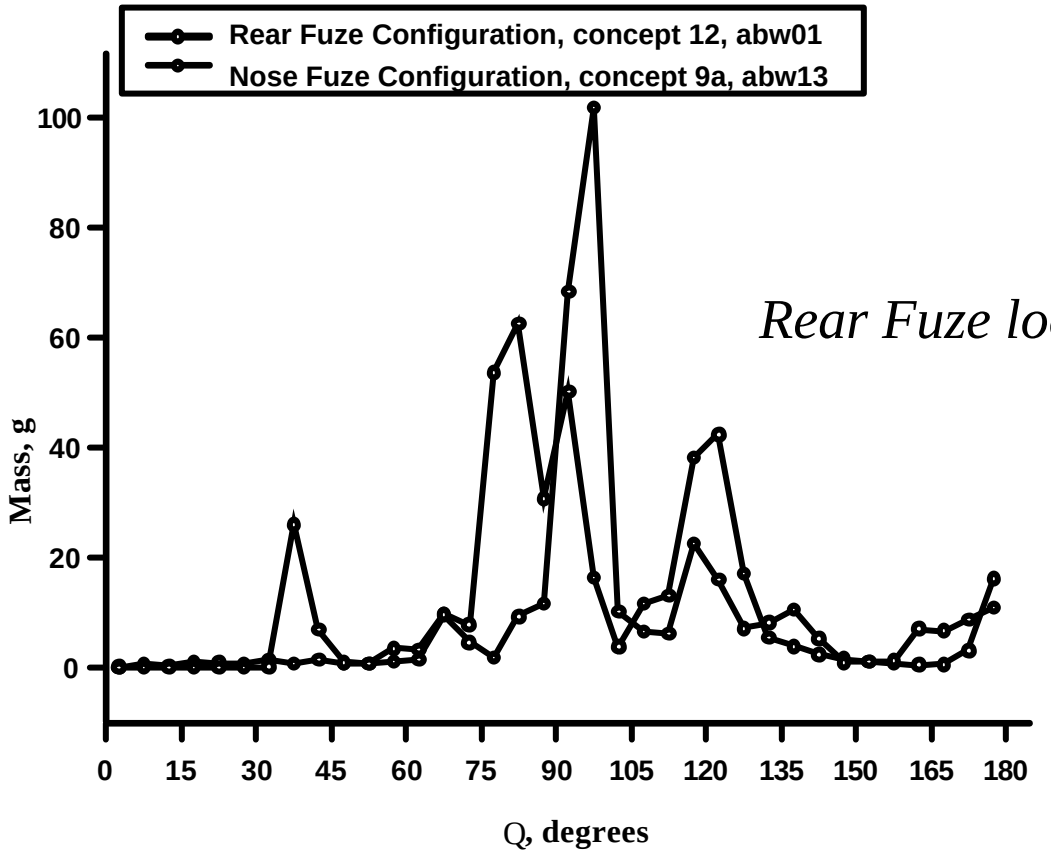
ALACV A/B Warhead Downselected Baselines

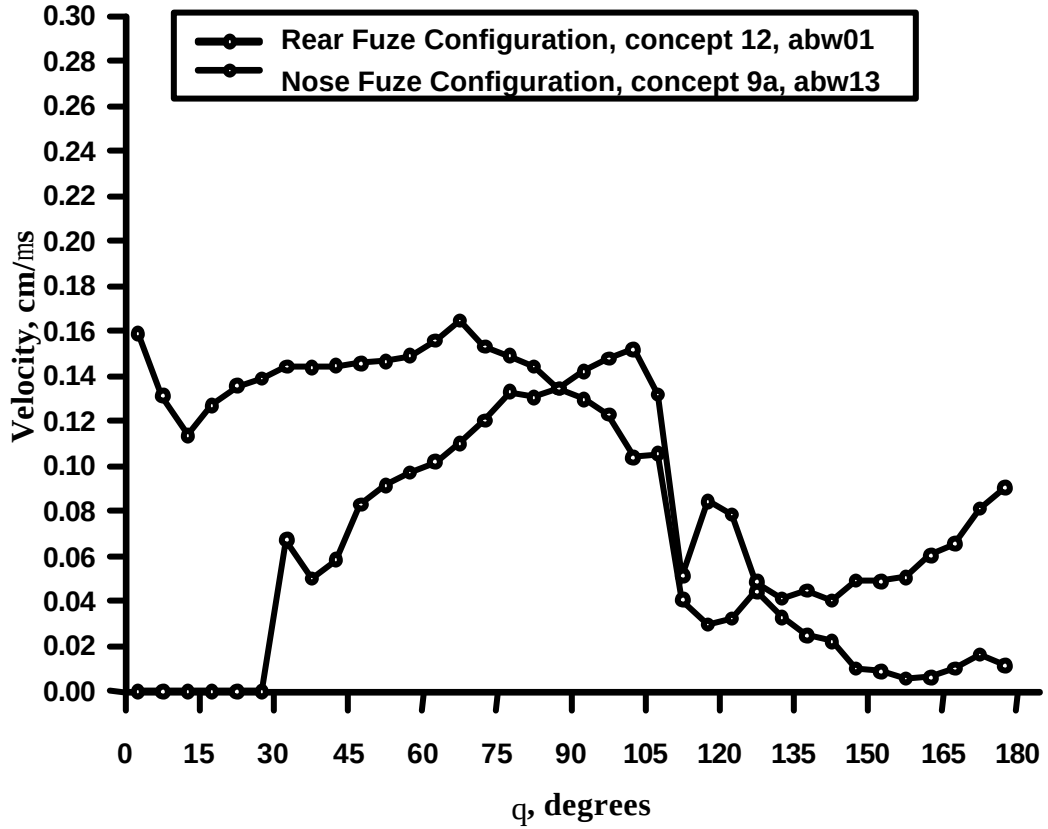


Rear Fuze Configuration (concept 12, abw01)

Nose Fuse Configuration (concept 9a, abw13)



Rear Fuze looks better


Rear Fuze Configuration, concept 12, abw01
Nose Fuze Configuration, concept 9a, abw13
Velocity, cm/ms
0.30
0.28
0.26
0.24
0.22
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0
15
30
45
60
75
90
105
120
135
150
165
180
q, degrees

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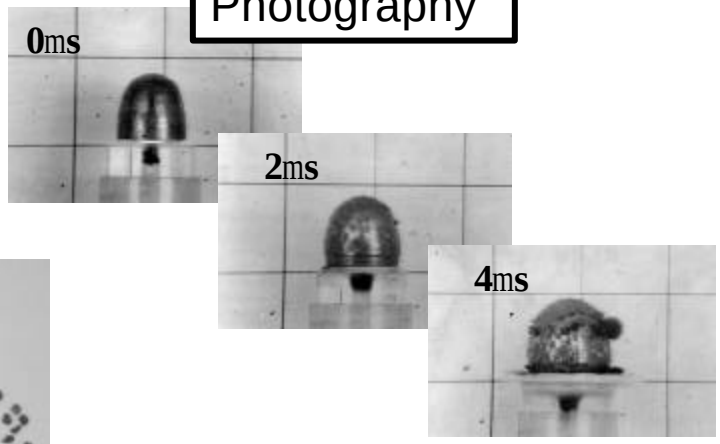
Fragmentation Testing

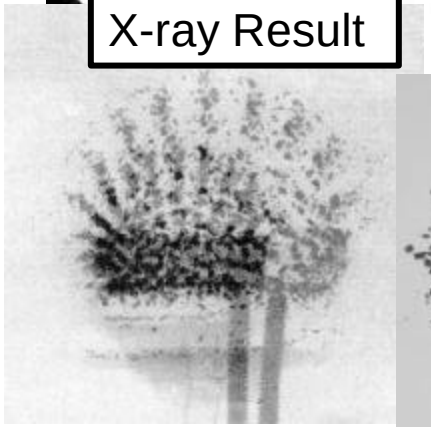
Test Set-up

Original Warhead

High Speed Photography

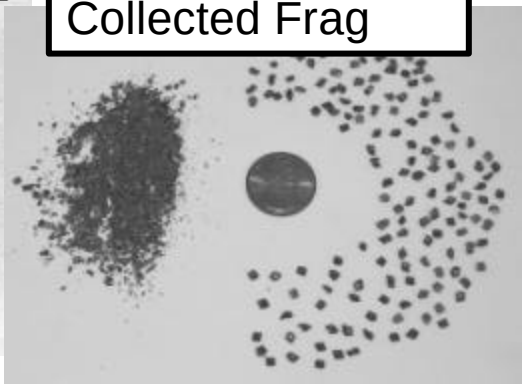


X-ray Result



Velocity Distribution!

Collected Frag



Mass Distribution!

- ***Velocity Distribution***
- ***Mass Distribution***
- ***Required Design Information***
- ***Less expensive/time than Arena***
- ***Final Prototype Arena Testing***

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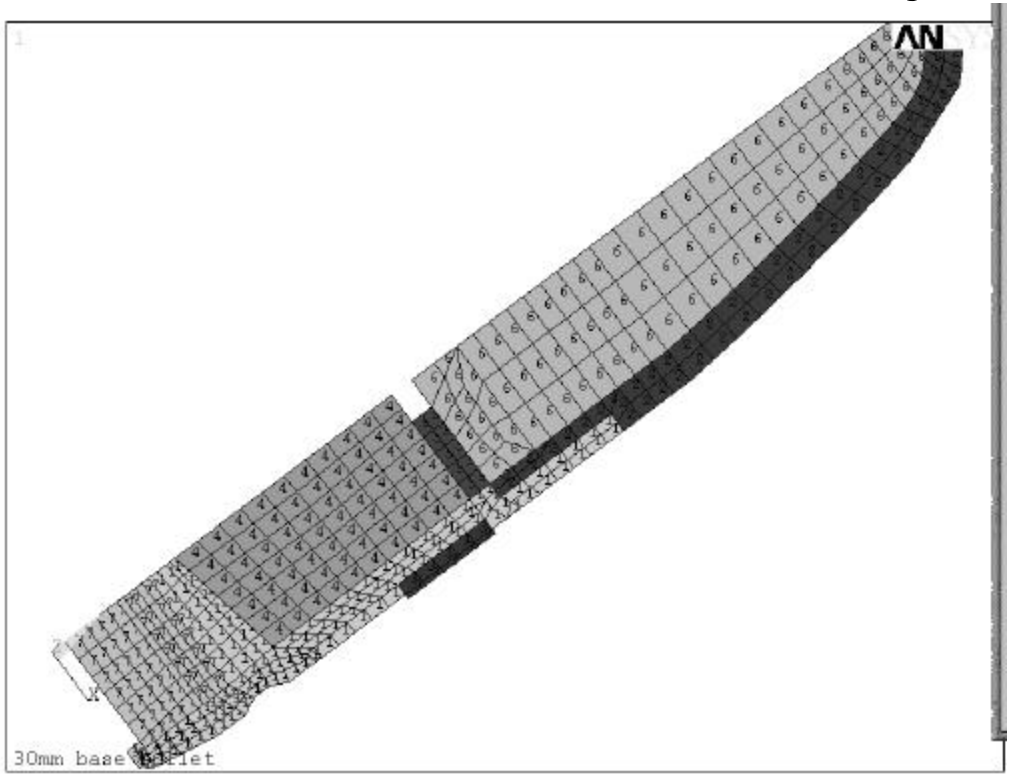
Base Initiated Steel Baseline Finite Element G-load analysis



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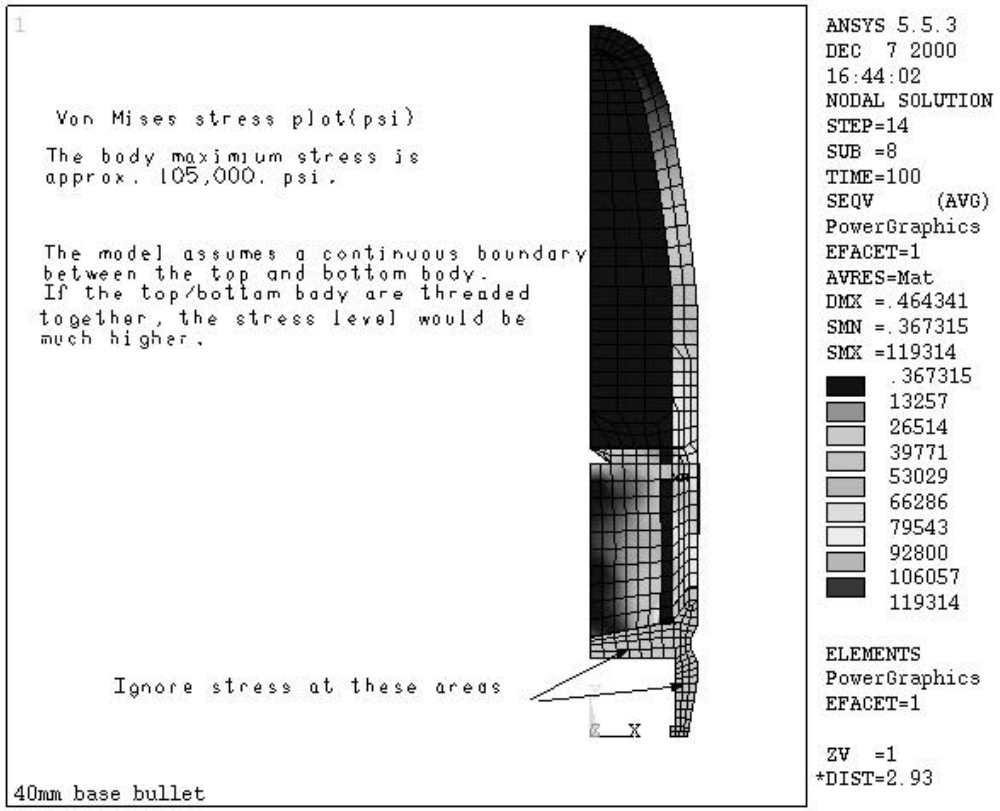
Finite Element G-load analysis

Warhead
Survives
Full Load



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ALACV FUZE

- In-house Design of a Modular Timed Fuze
  - Maximum Use of Off-The-Shelf Components
  - Pre-set Time Input
  - Single Shot Test Firing Only
- CRADA with Industry
  - Define Interfaces between Electronics/S&A
  - Partner to Demo Advanced Designs & Multiple Mission Modes

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ALACV Baseline Projectile