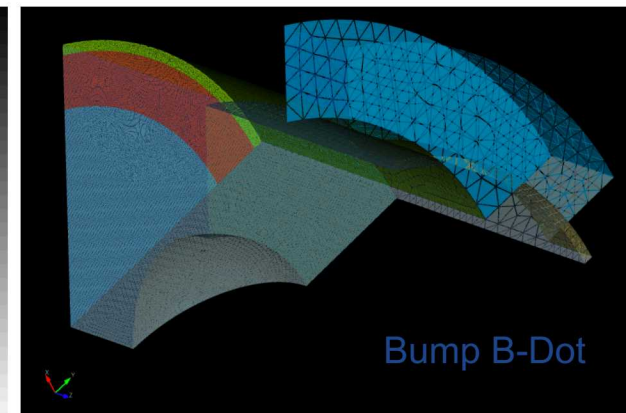
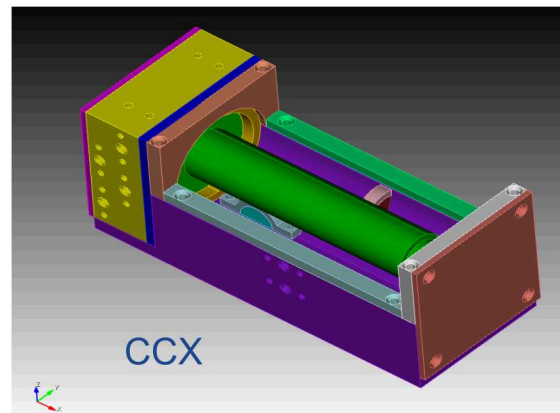
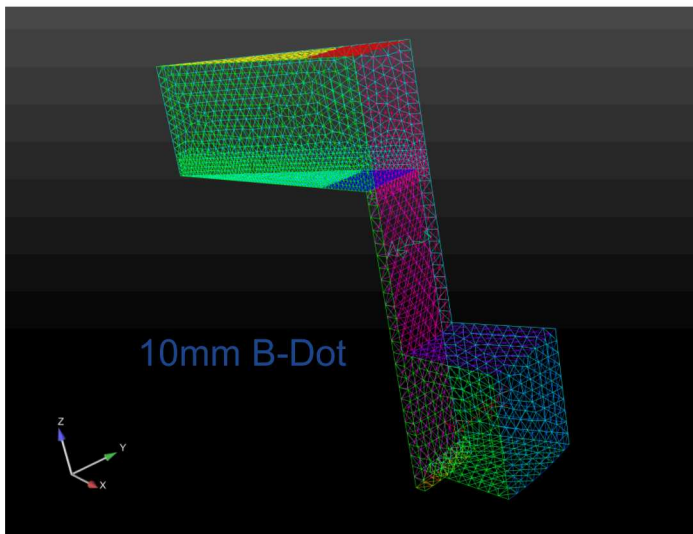


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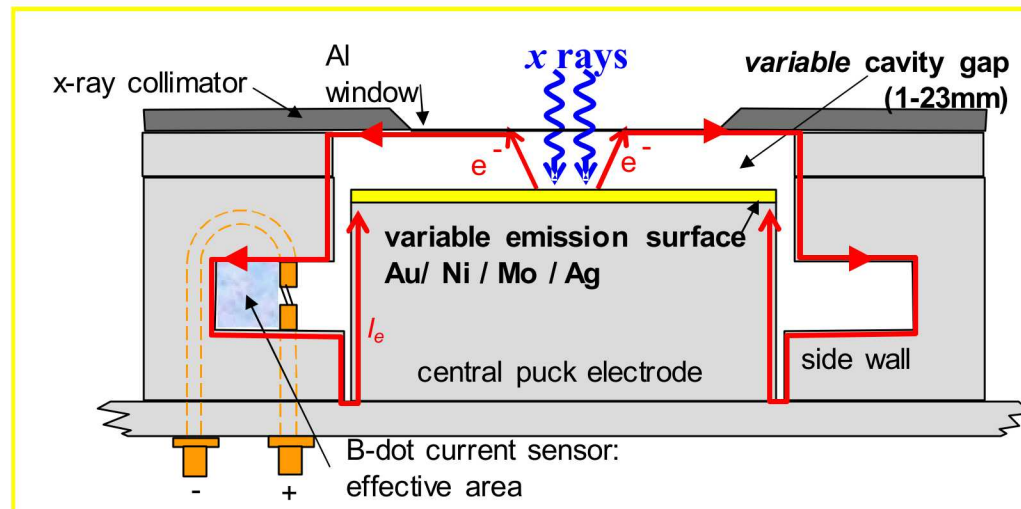


SAND2019-xxxx R
NZ8 SS Source Ar-Fill B-Dot Post-Simulations
Z2751 Scaled Spectrum
C. David Turner, 01352, 65755/003.06.02

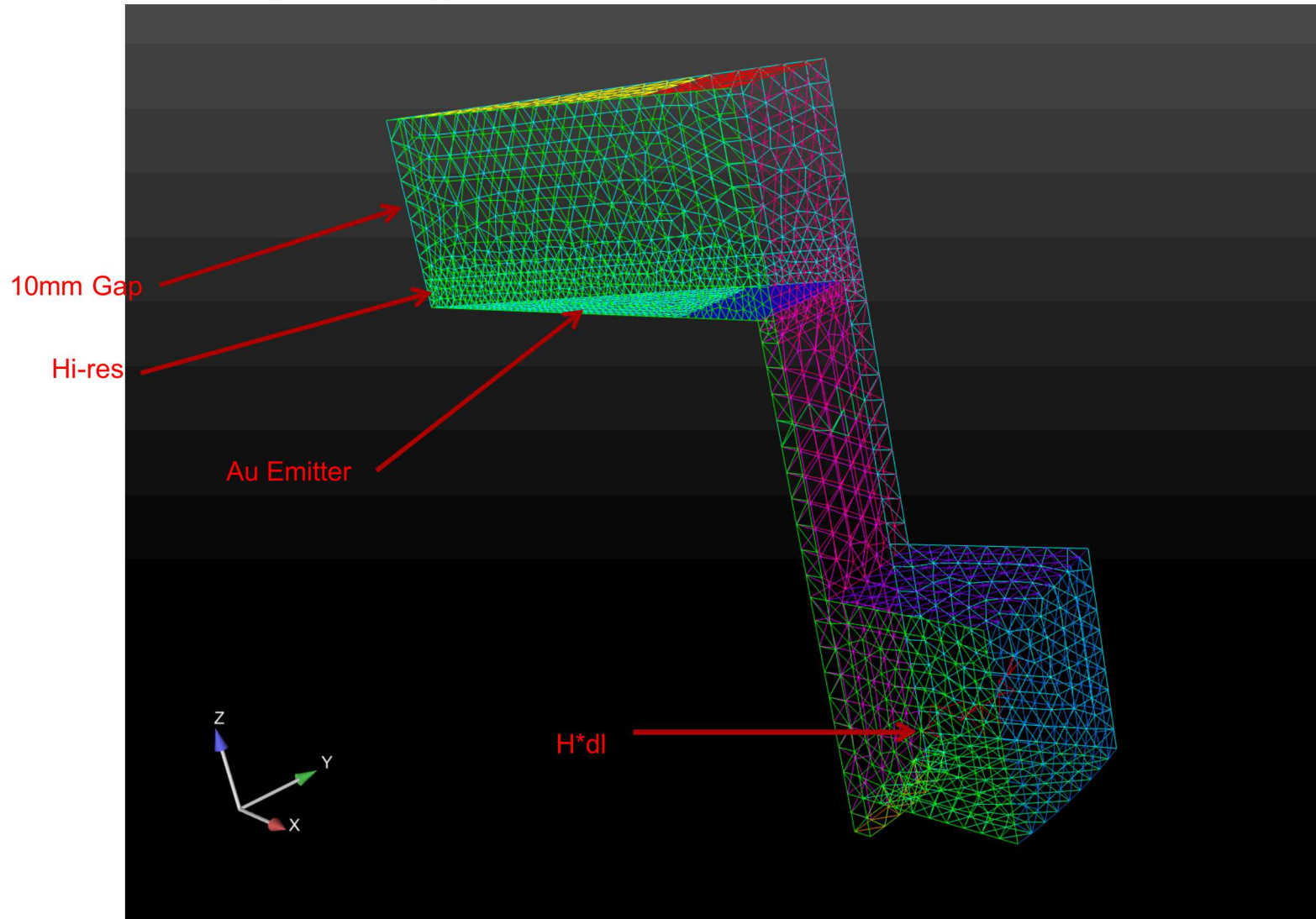
June 24, 2019

Ar-fill 10mm B-Dot at Z on NZ8 Shot 1 (Z3356)

- Pressures of 50, 100, 200, and 300 mT Ar
- Surrogate Z2751 SS source (Z3356 measured spectrum not yet available)
 - Filter: 0.8/cos(40) mm Lithium, .01" Kapton (filtered spectrum) and 5 μ m Al, .00513 mm Carbon
 - Scaled to correct Z3356 filtered yield of 53.5 kJ
- Au emitter
- EMPHASIS and EMPIRE simulations using common mesh and source with SCL emission

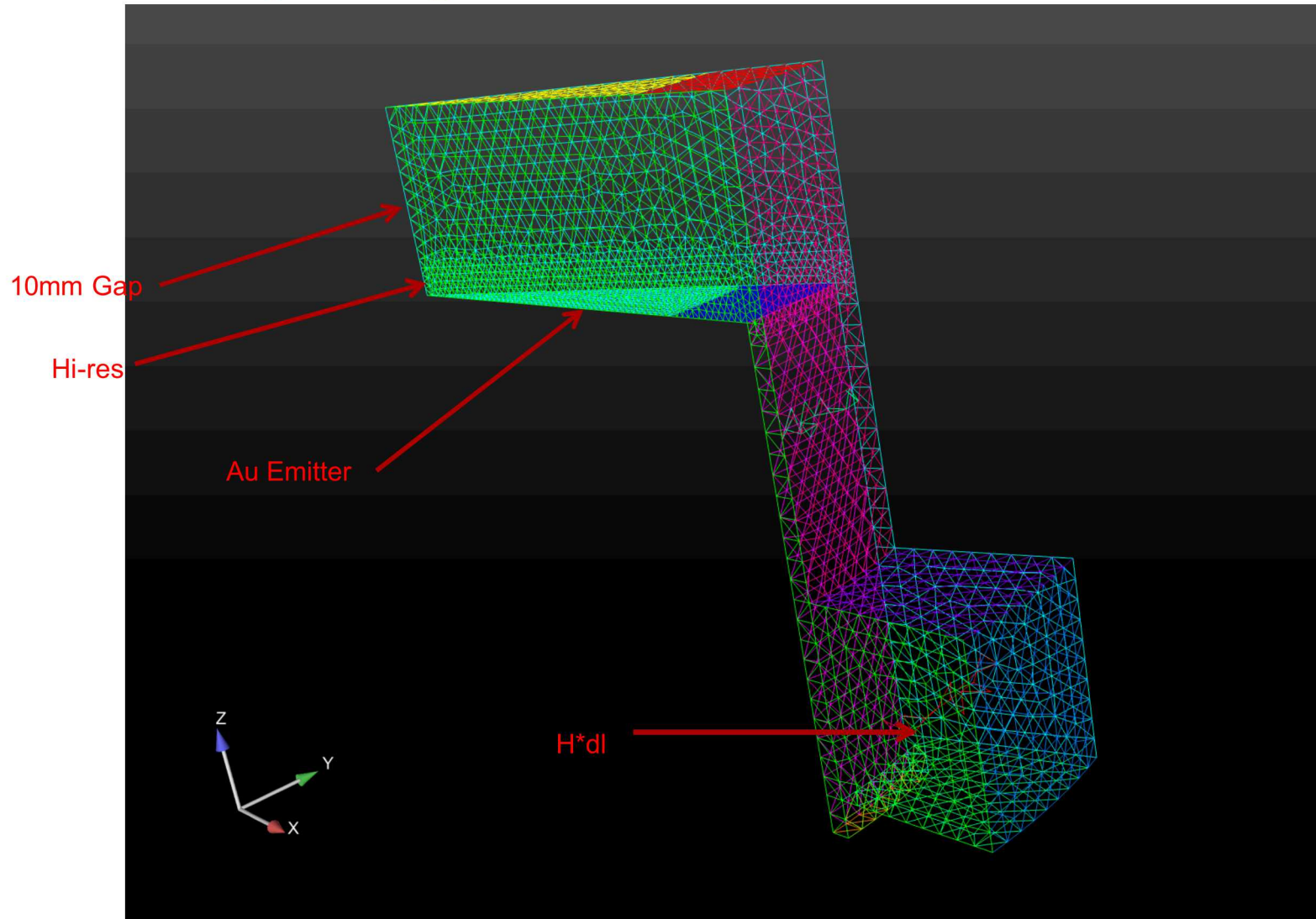


Model: 15-degree wedge 2 resolutions: Res 1



ITS/EMPHASIS Model

Model: 15-degree wedge 2 resolutions: Res 2



ITS/EMPHASIS Model

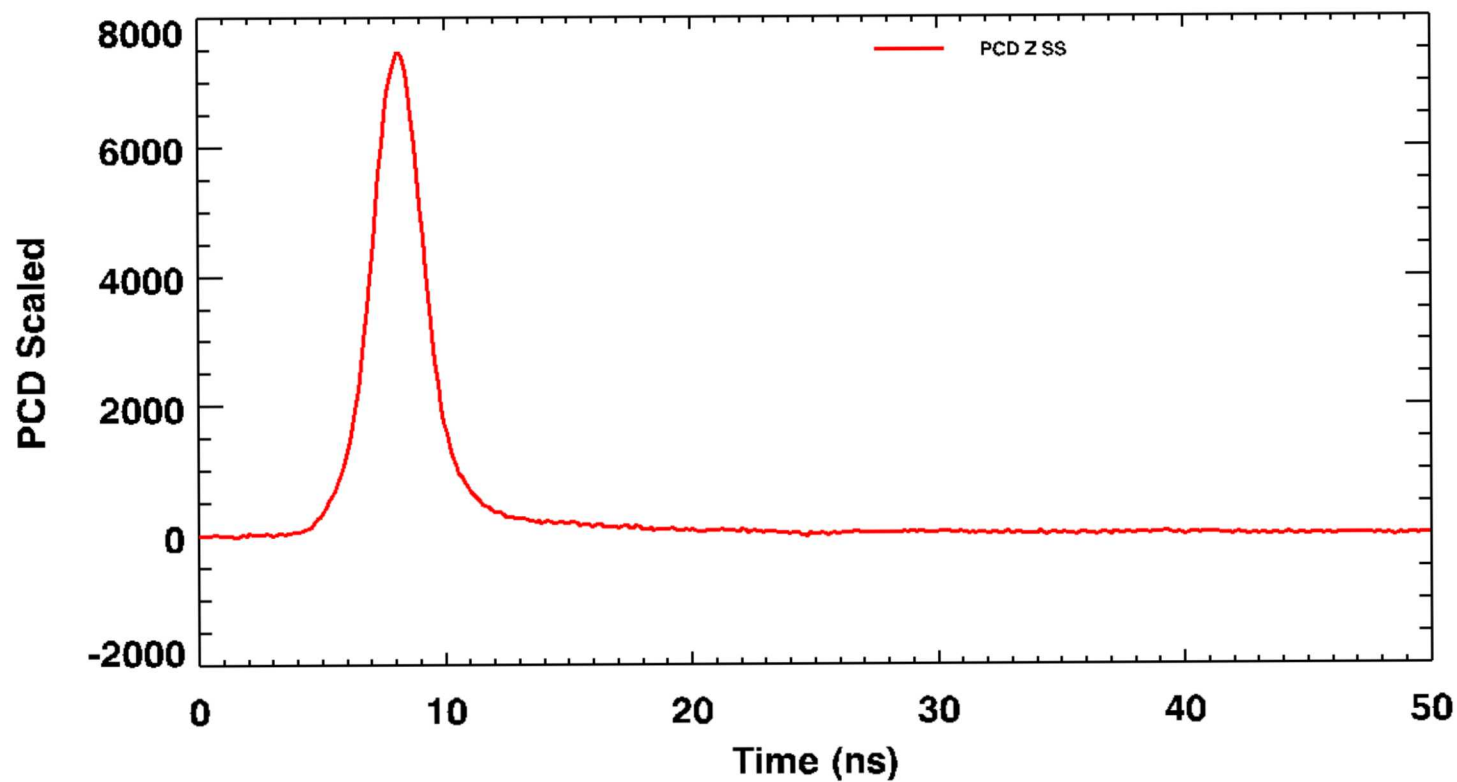
Ar-fill B-Dot: Simulations

- Scaling to total photons and PCD waveform provided by T. Flanagan via 30 May 2019 email
 - Surrogate SS Z2751: Total photons filtered by 10mil Kapton $4.57e19$, disk source
- EMPHASIS interface-refinement mesh with CUBIT
 - Resolution 1: 1mm generally, 500um above emitter, ~25K total elements
 - Resolution 2: 0.77mm generally, 375um above emitter, ~45K total elements
- Previous refinements with EMPHASIS down to 25um above the emitter on a similar B-Dot showed minimal effect

- ITS Simulations
 - 1.e11 histories
 - Run time about 2 hours 2 nodes Serrano
- EMPHASIS Simulations
 - Resolution 1 50mT 2 hours 2 nodes Serrano 60ns simulation time
 - Resolution 2 50mT 2 hours 2 node Serrano 60ns simulation time
 - Total emitted current is about 6 kA from Au puck obtained by differentiating qepcre (primary e^- created charge) diagnostic
- EMPIRE Simulations
 - Resolution 1 50mT ~72 hours 36 cores CEE-compute017 20ns simulation time
 - Resolution 2 50mT ~>72 hours 36 cores CEE-compute017 20ns simulation time

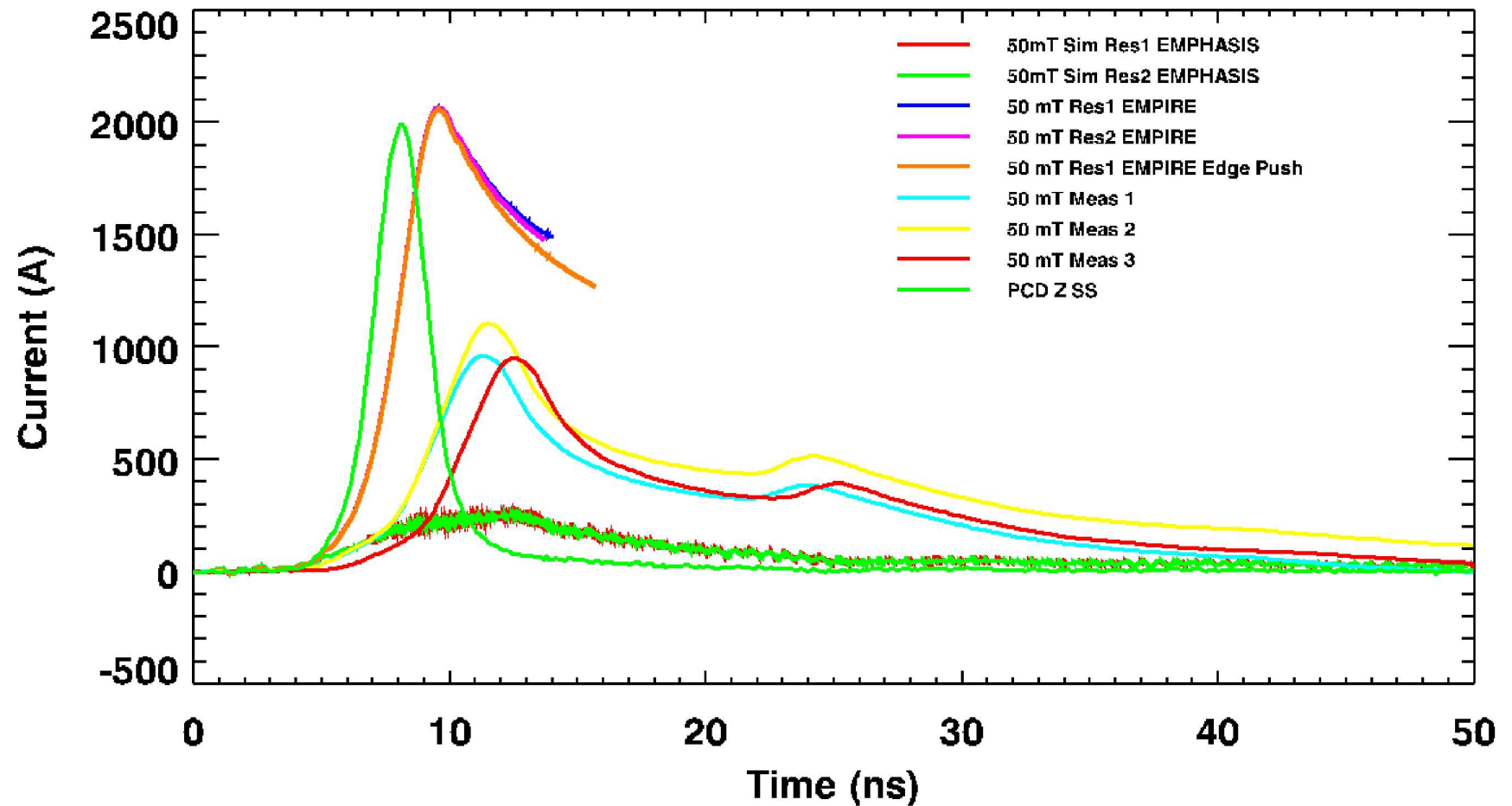
Ar-fill B-Dot: Results

- The measured PCD waveform provides the time history for the EMPHASIS simulations



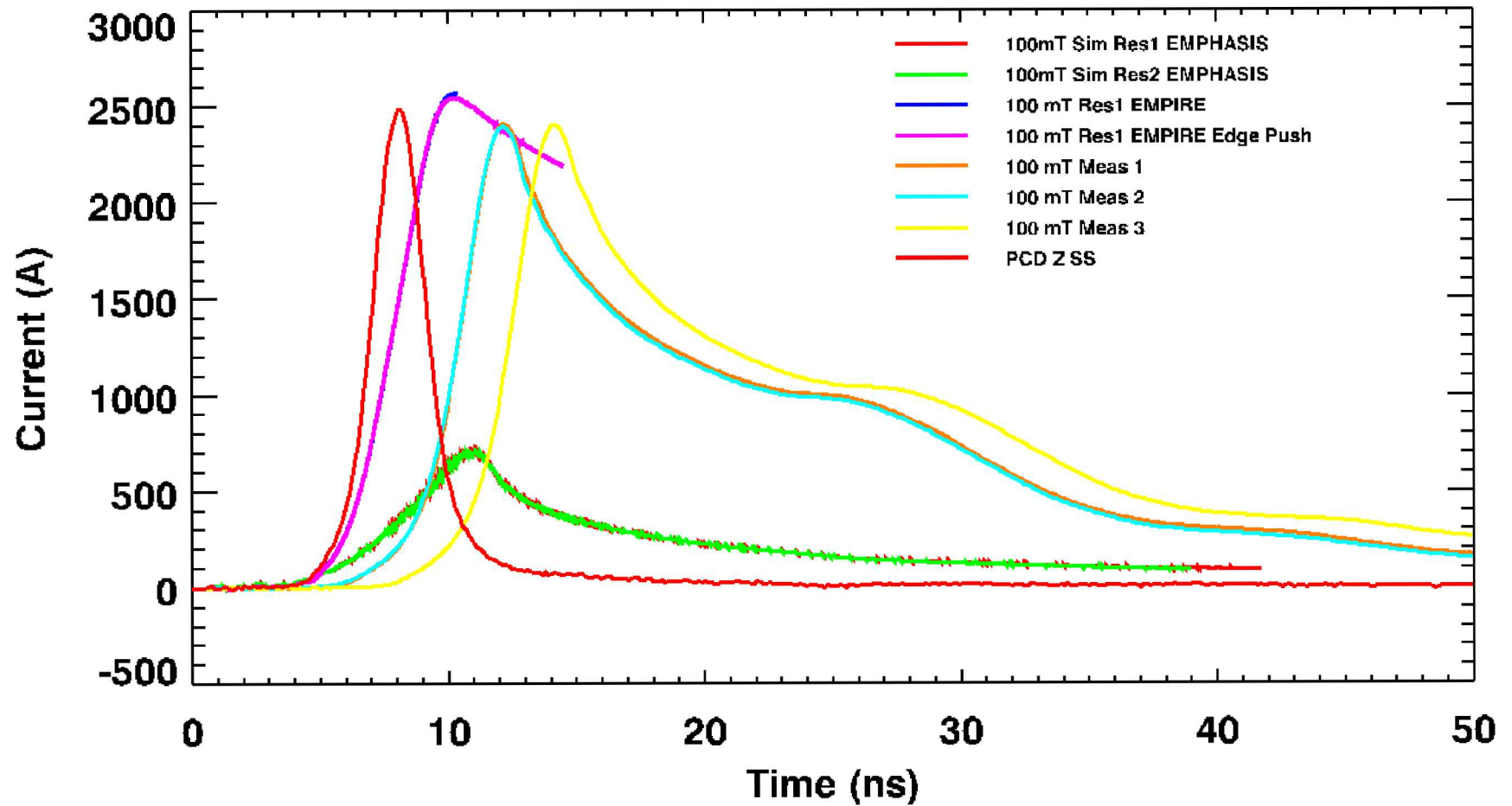
Pressure: 50mT

NZ8 Shot 1



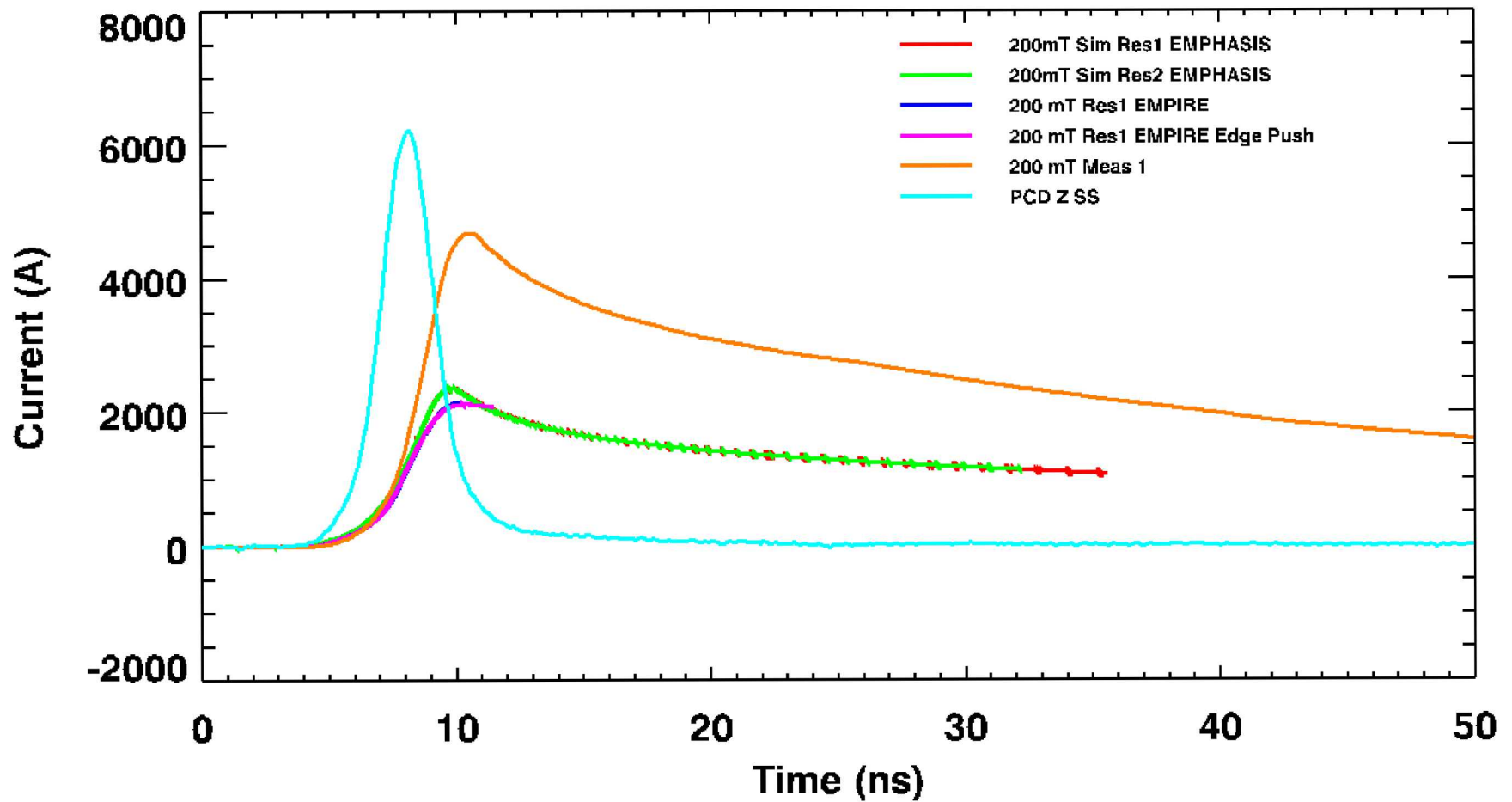
Pressure: 100mT

NZ8 Shot 1



Pressure: 200mT

NZ8 Shot 1



Pressure: 300mT

NZ8 Shot 1

