

**Preliminary Investigation of  
Johann Davidson Pulse for Biorid II  
Certification**

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**Informal Working Group Meeting for GTR7  
In Tokyo  
Feb. 3, 2010**



# Agenda

- Johan Davidsson (Chalmers) proposal
- Initial Denton Investigation
- Sled with weight package pulse
- Sled pulse with dummy
- Dummy response
- Pros and Cons of proposal
- Decision?



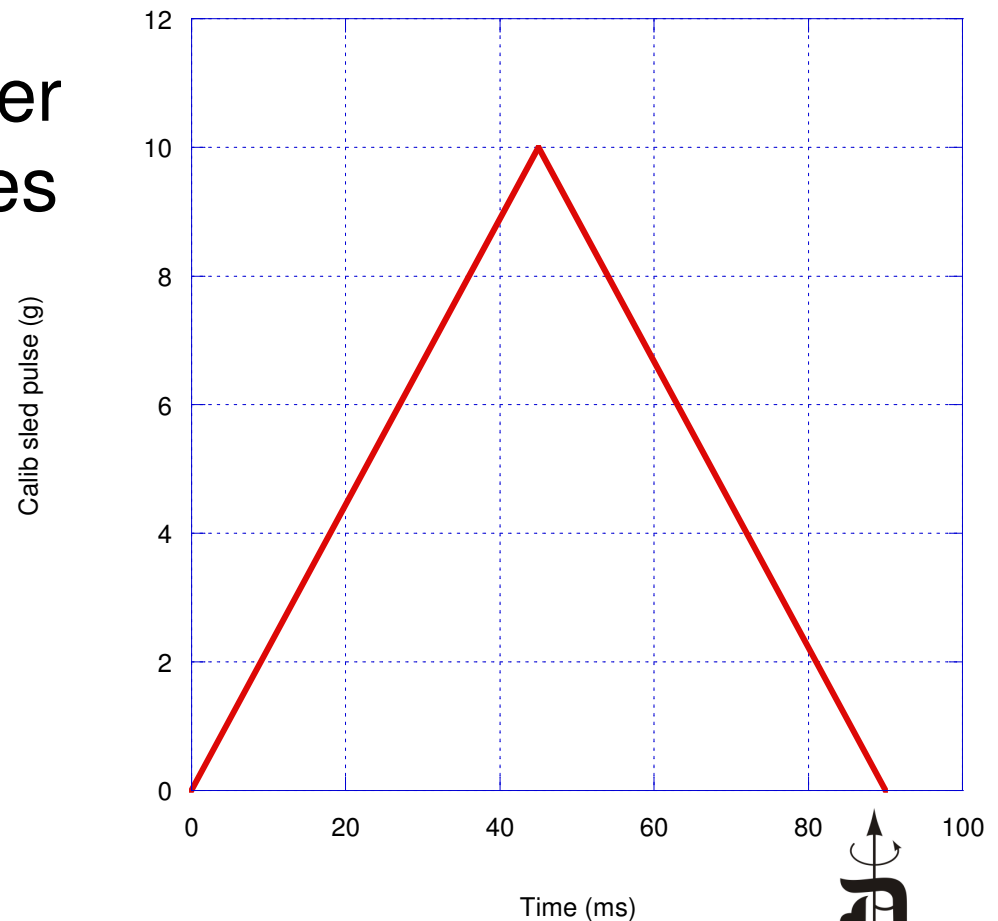
# Johan Davidsson (Chalmers) proposal

- Johan proposed that a pulse closer to EuroNCAP might better sort dummy differences

Delta-V 16 kph

Sled acceleration duration 90 ms

Peak acceleration 10 g



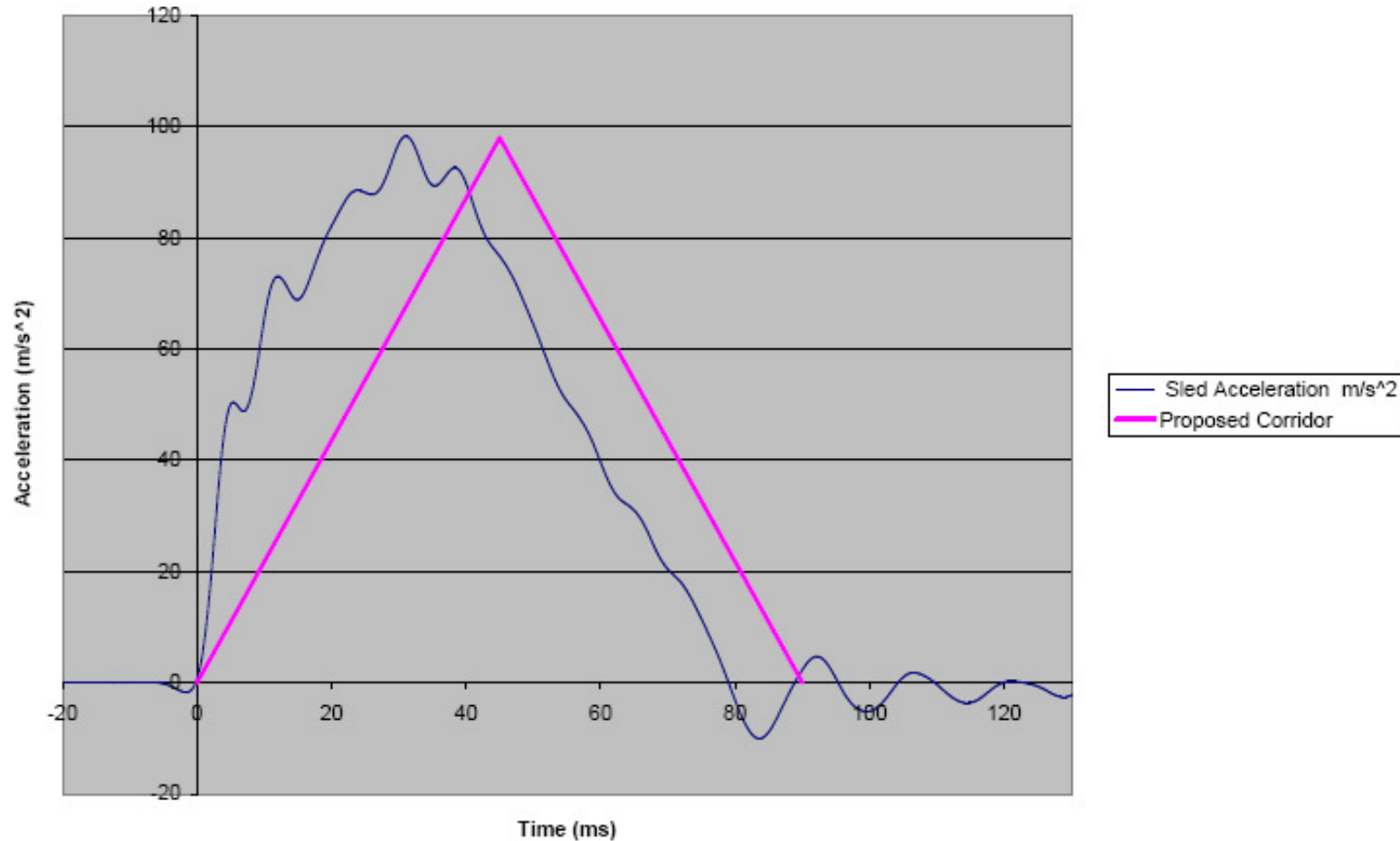
# Initial Denton Investigation

- Denton made several energy transfer devices to see whether this pulse is feasible
- First tested on sled with weight package
  - Data presented Jan. 22
- Second tested with dummy

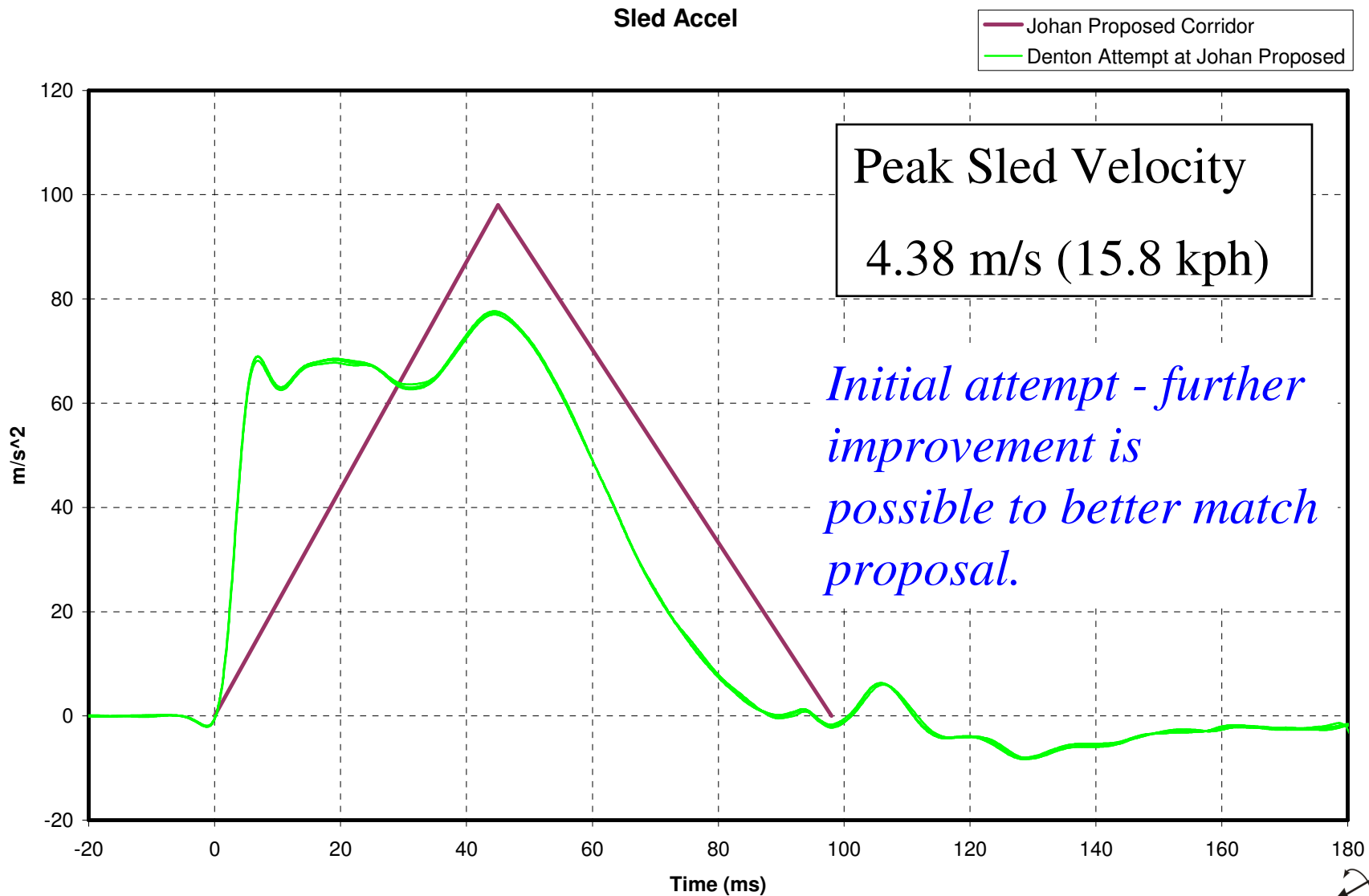


# Sled Pulse with Weight Package

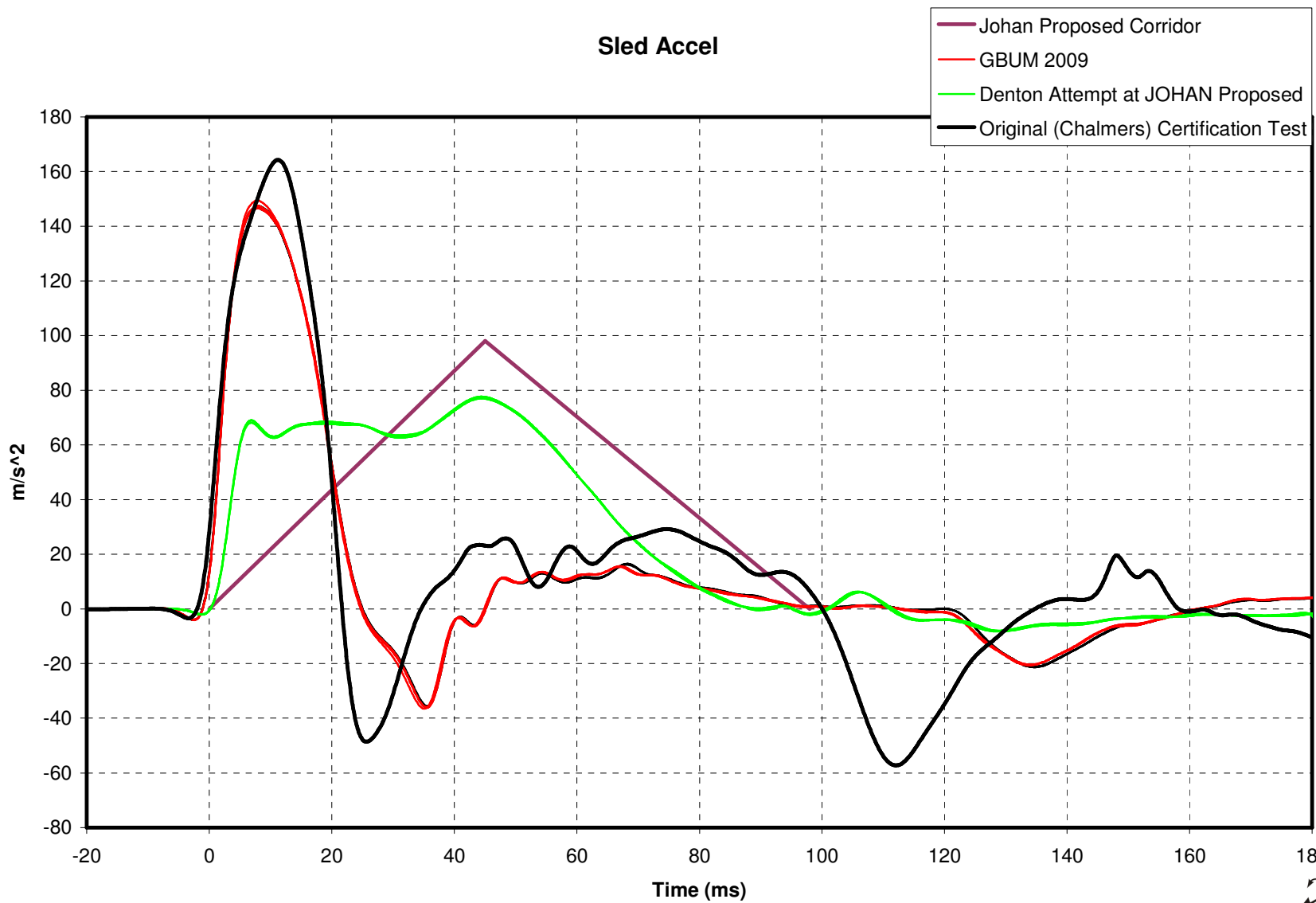
Proposed Sled Acceleration Corridor



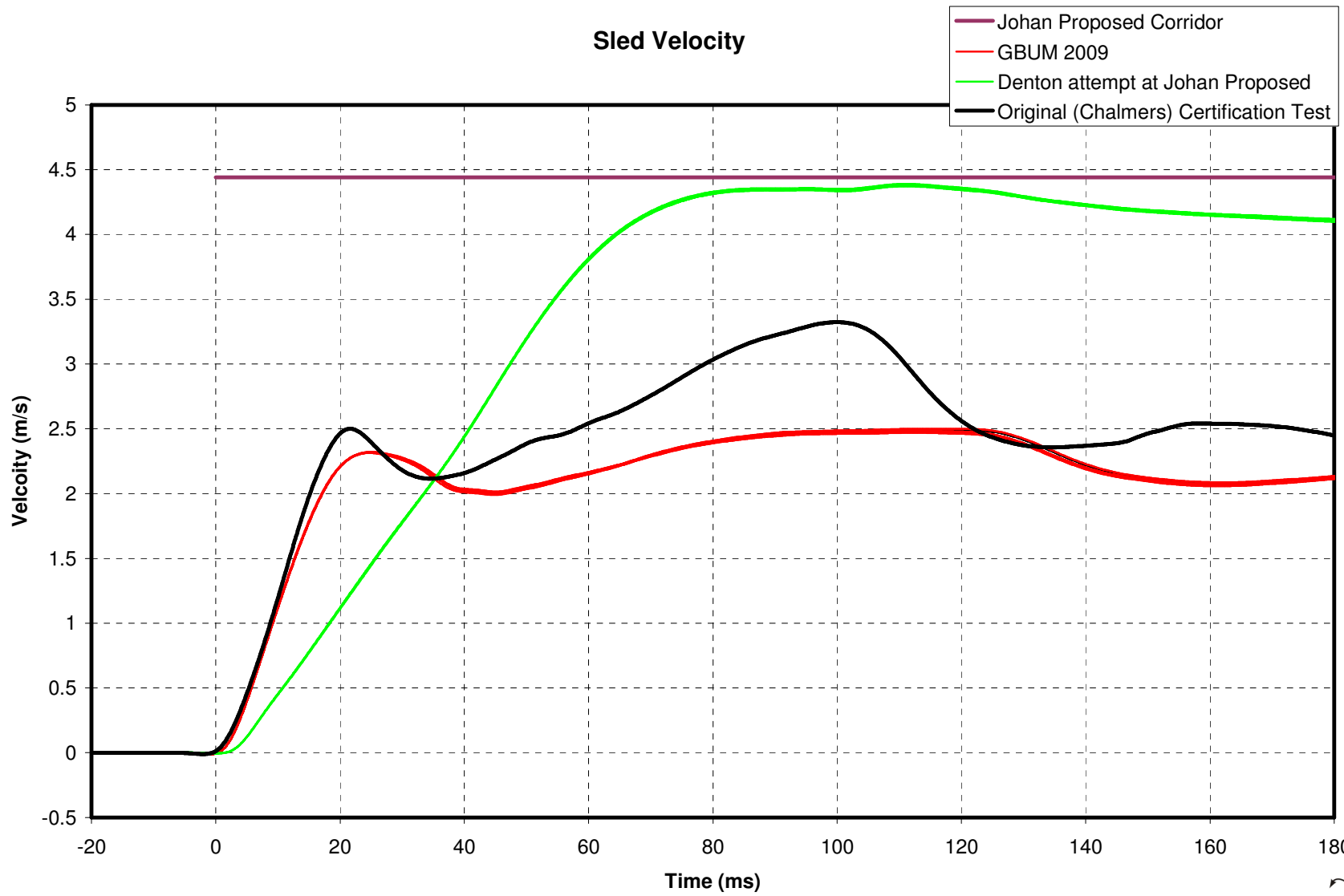
# Sled Pulse with Dummy



# Sled Pulse Comparison



# Sled Velocity Comparison





# Dummy Response to Johan Pulse

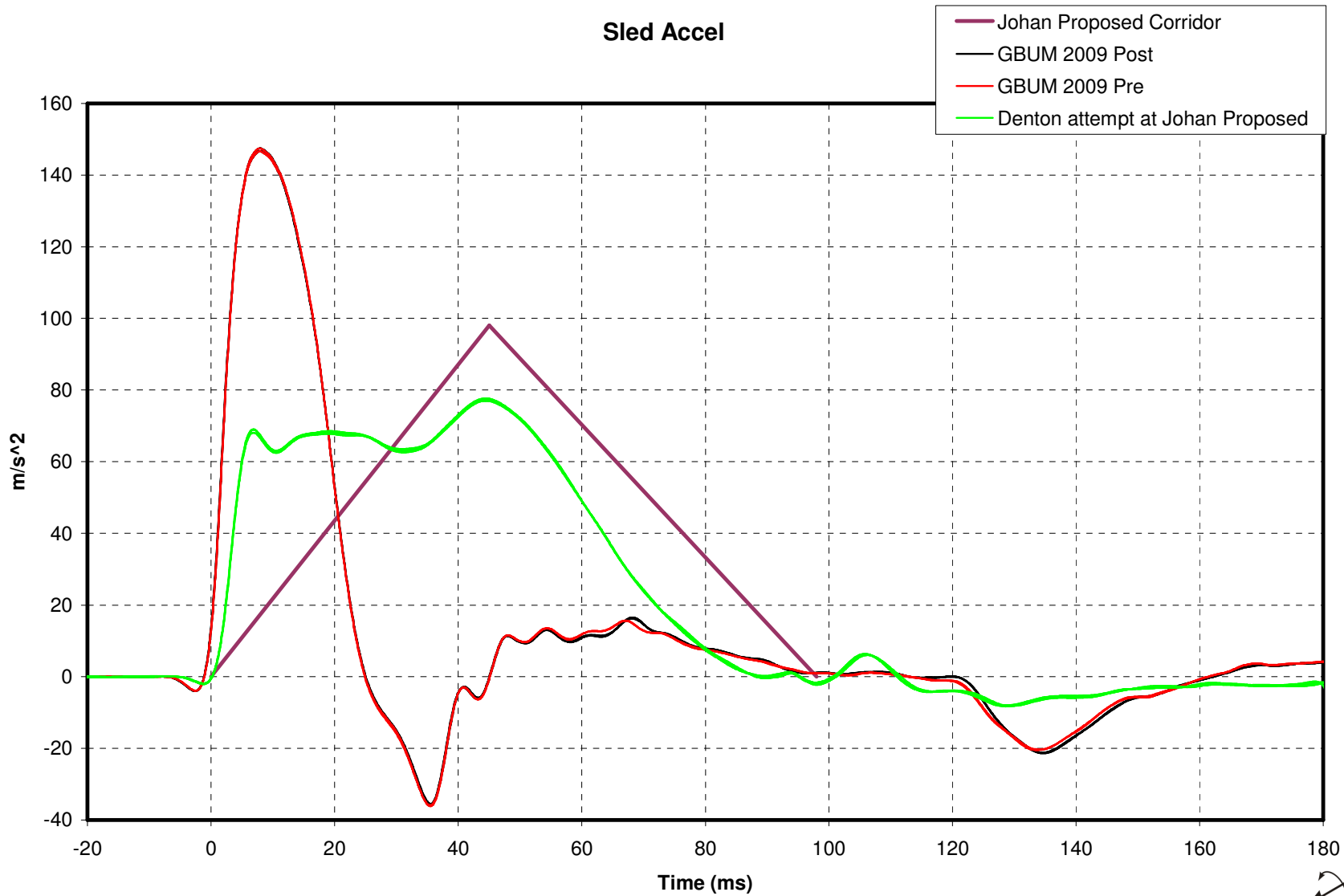
- One Dummy Tested
- 3 tests with GBUM 2009 (Pre)
- 5 tests with Johan proposed pulse
- 4 tests with GBUM 2009 (Post)
- Look at
  - Repeatability?
  - Does Johan pulse damage dummy?



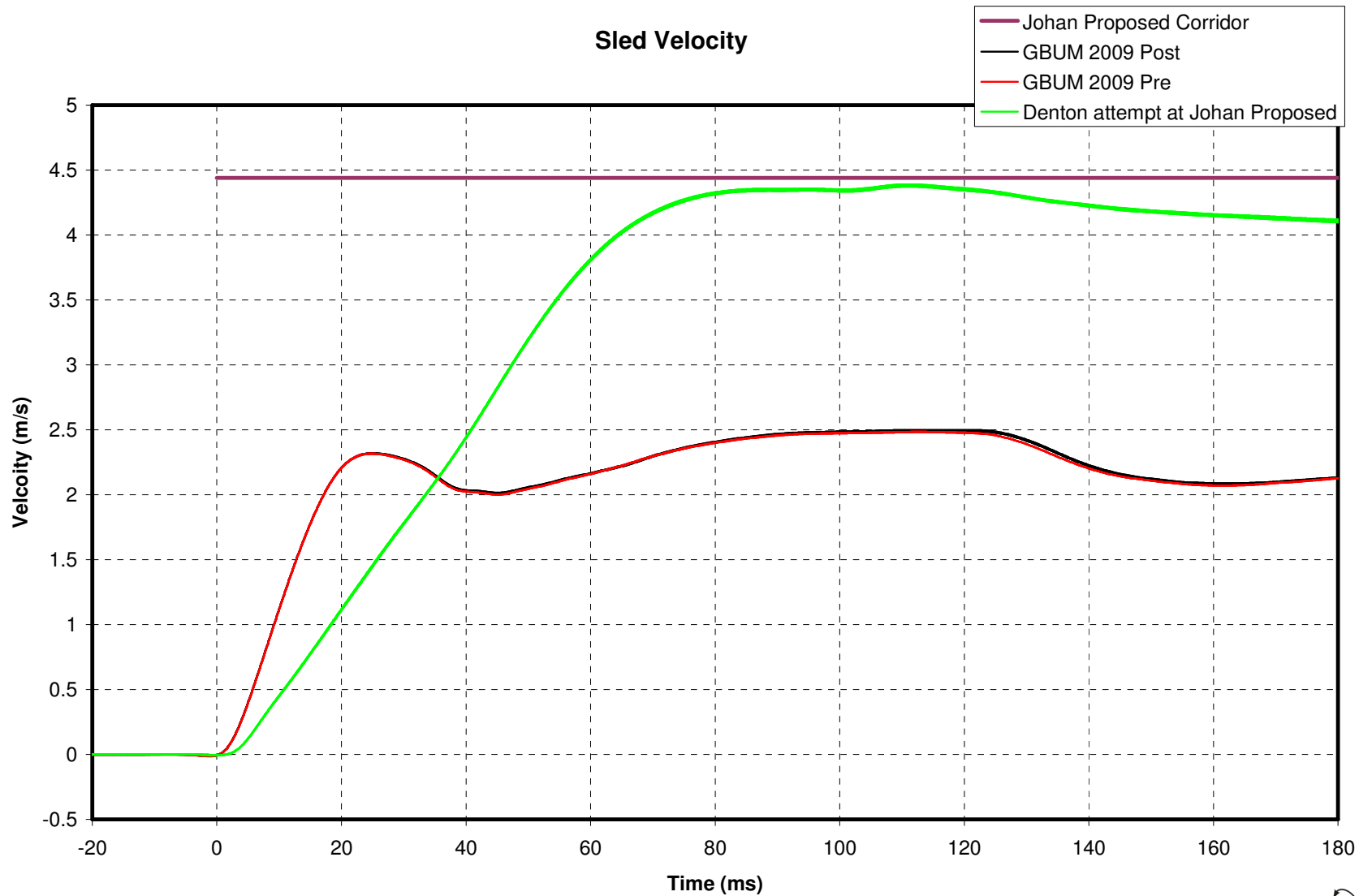
# Test Videos



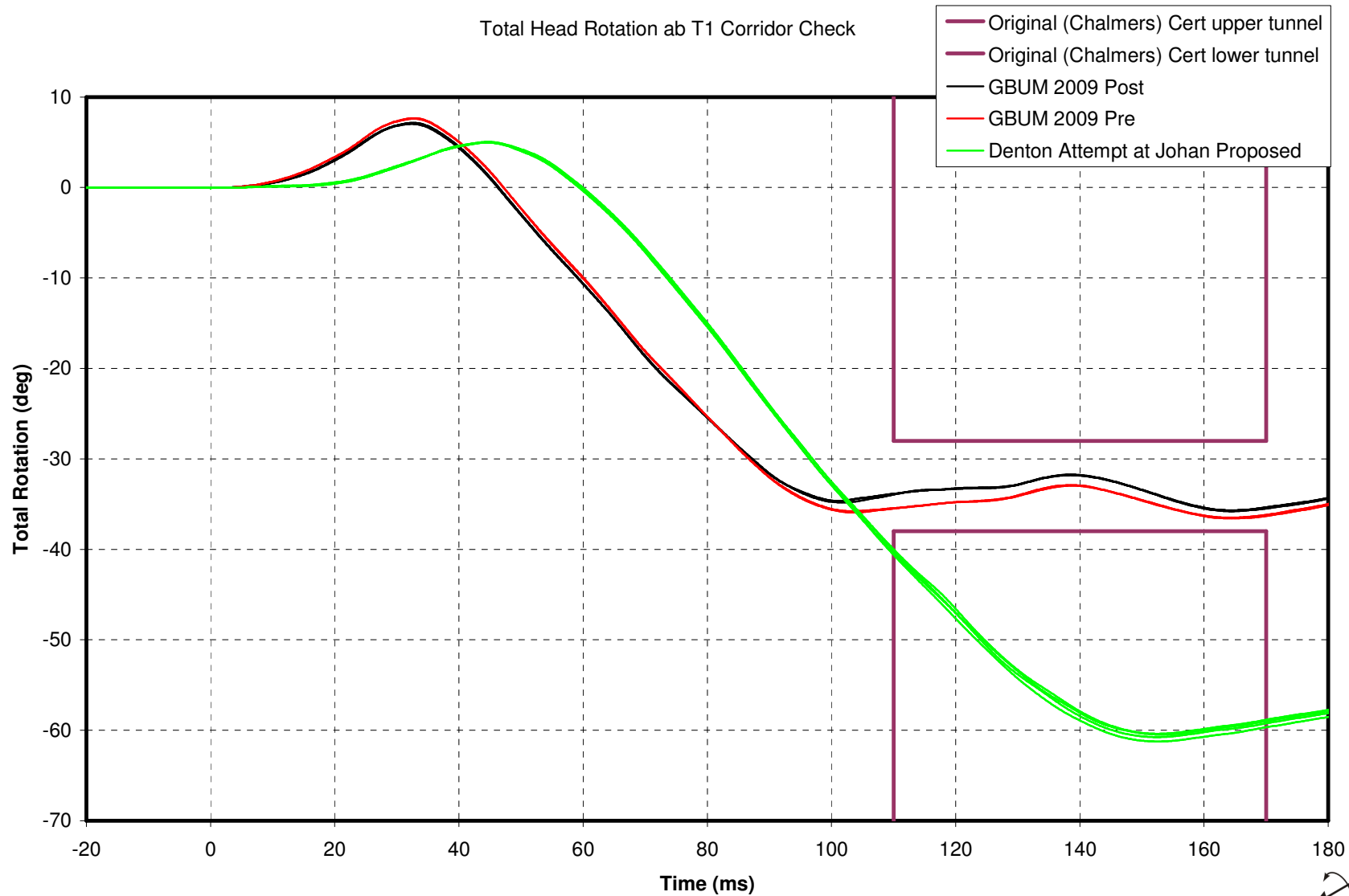
# Dummy Response to Johan Pulse



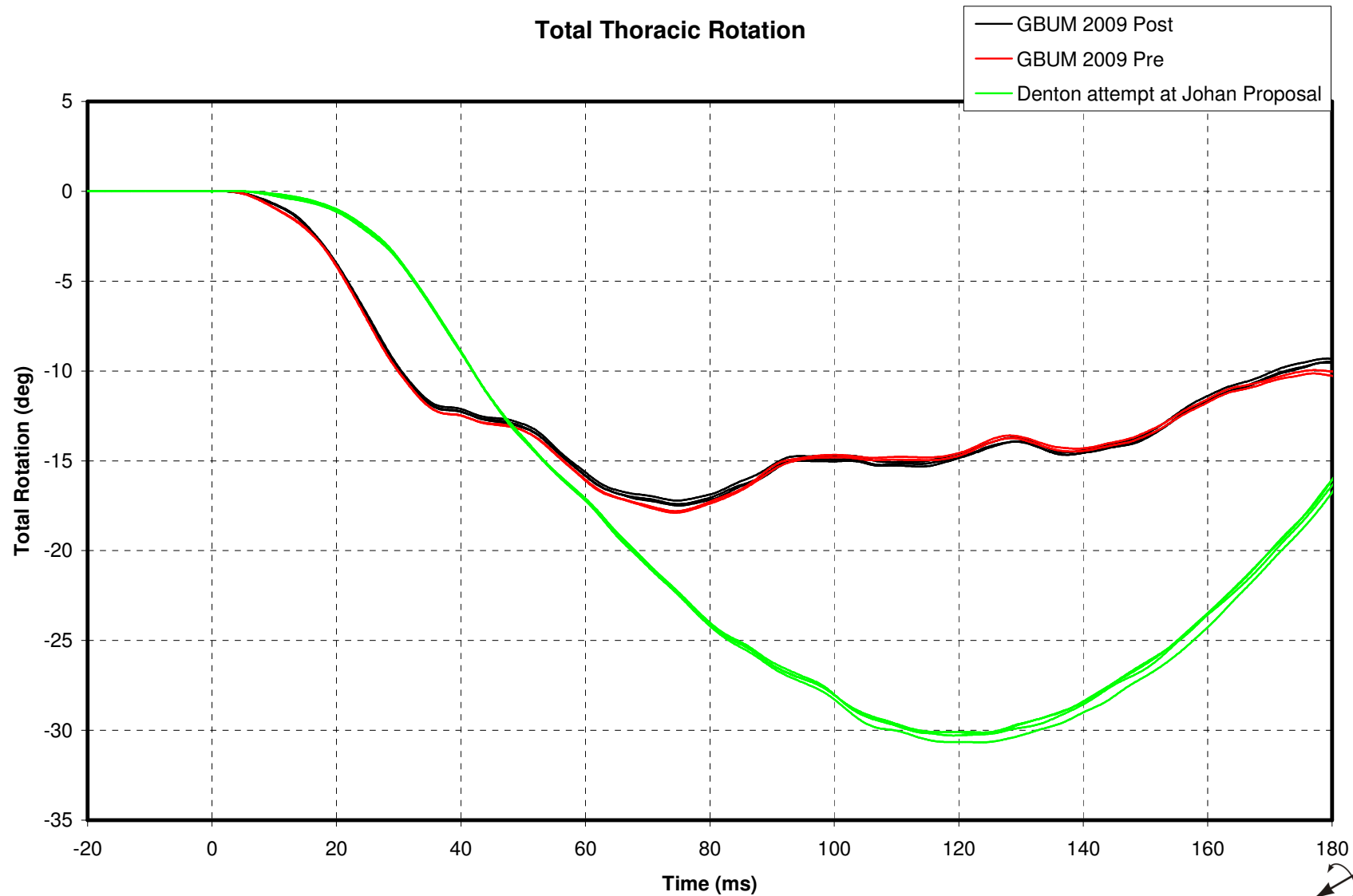
# Dummy Response to Johan Pulse



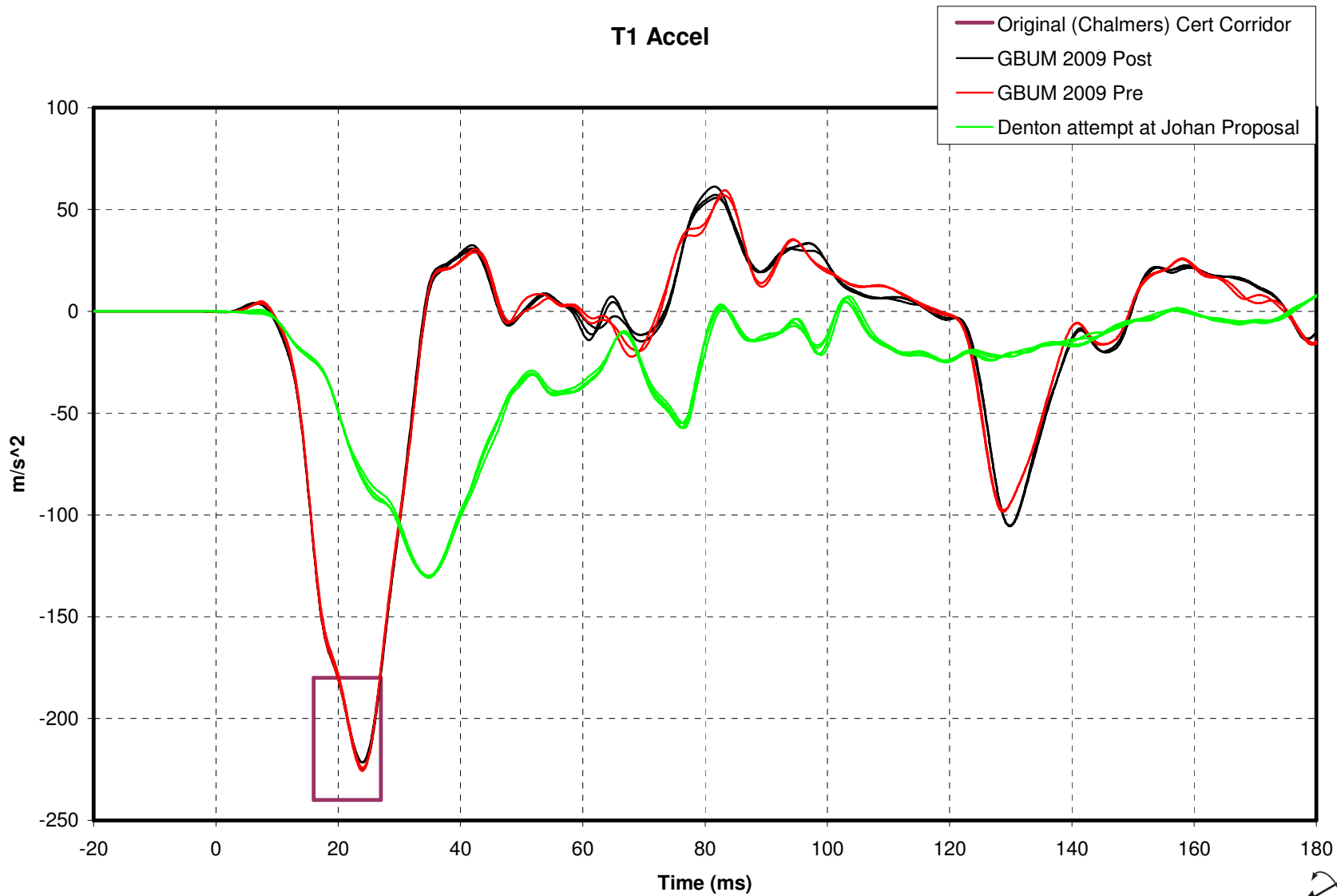
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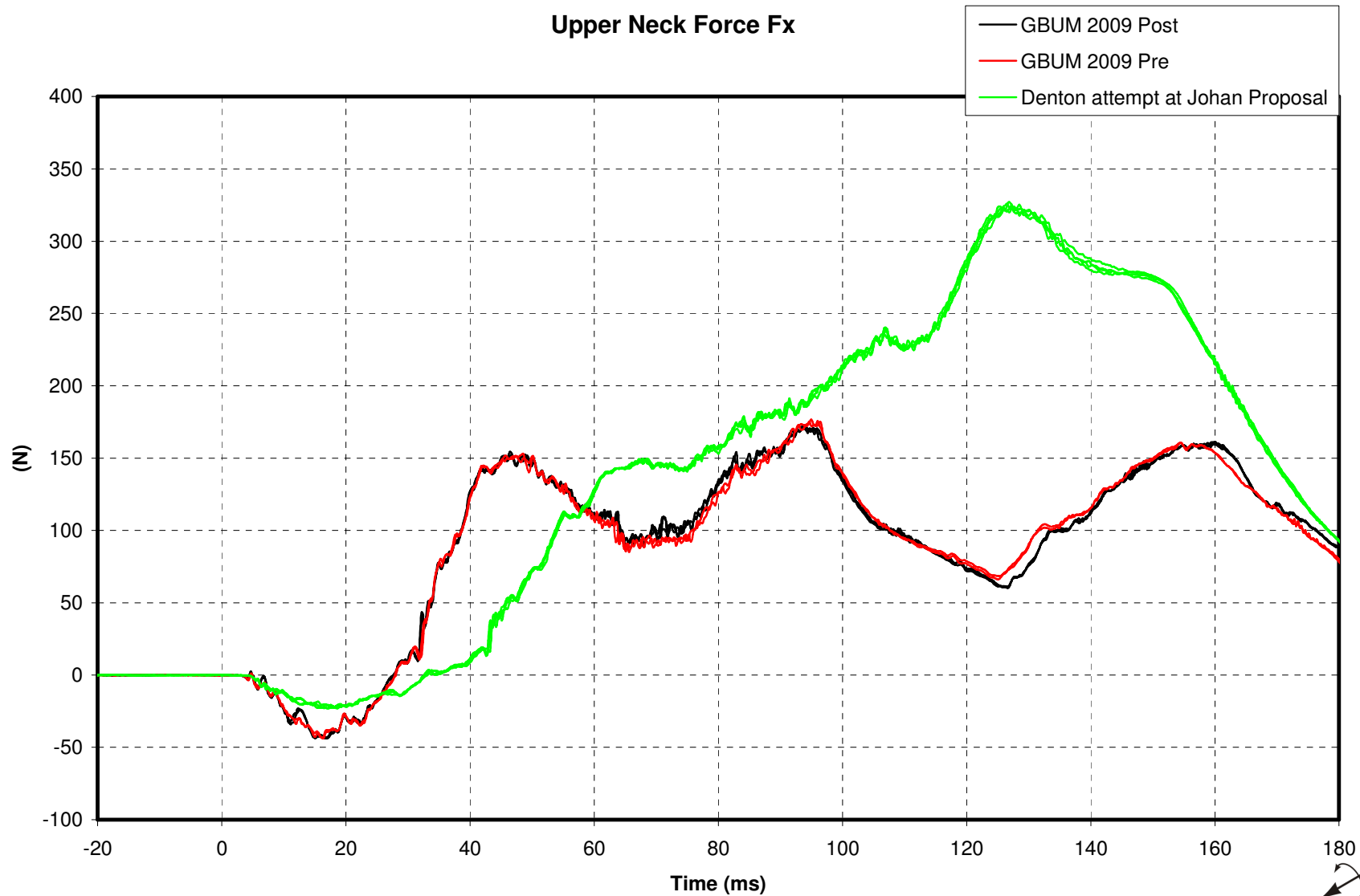
# Dummy Response to Johan Pulse



# Dummy Response to Johan Pulse

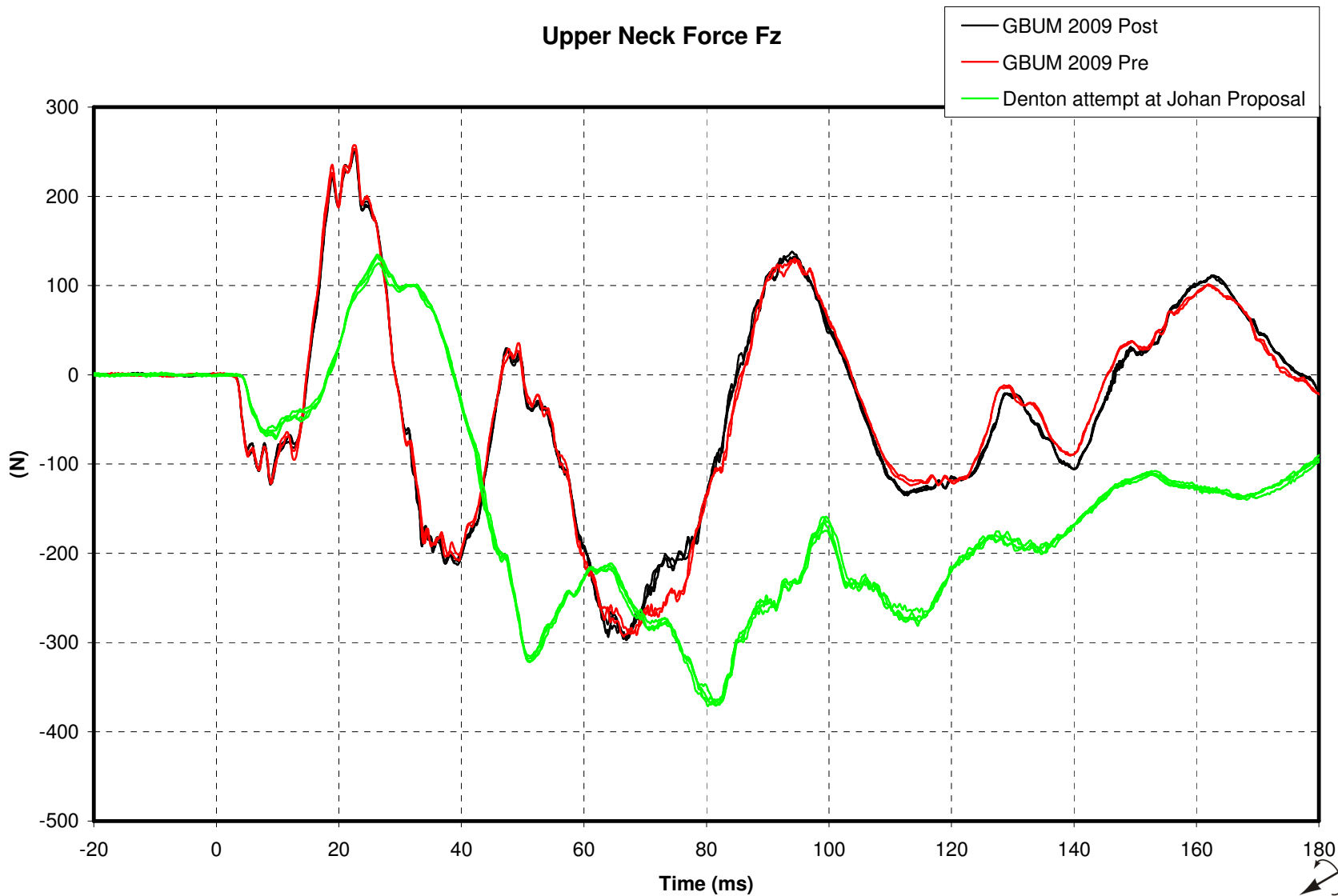


# Dummy Response to Johan Pulse

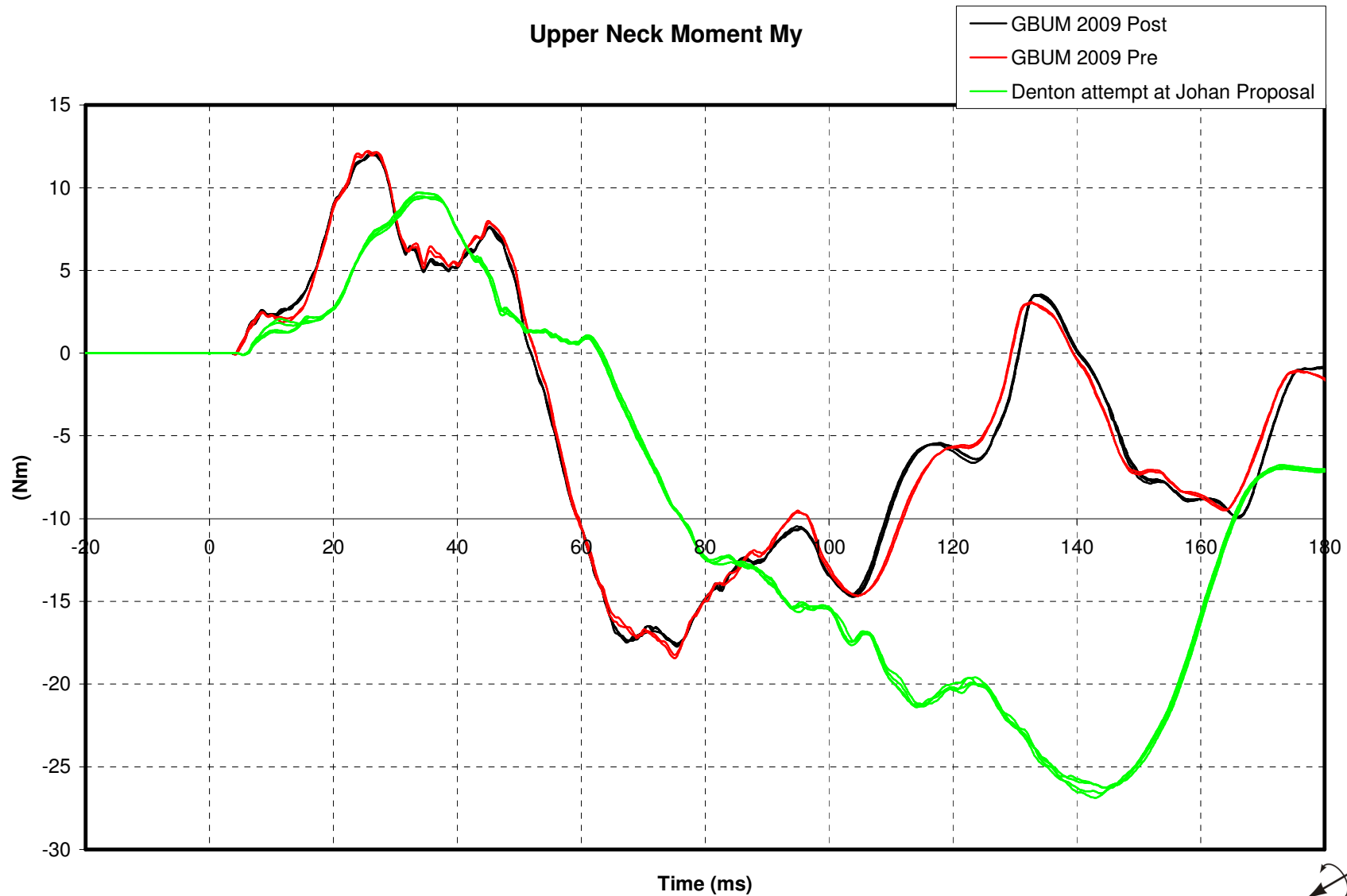




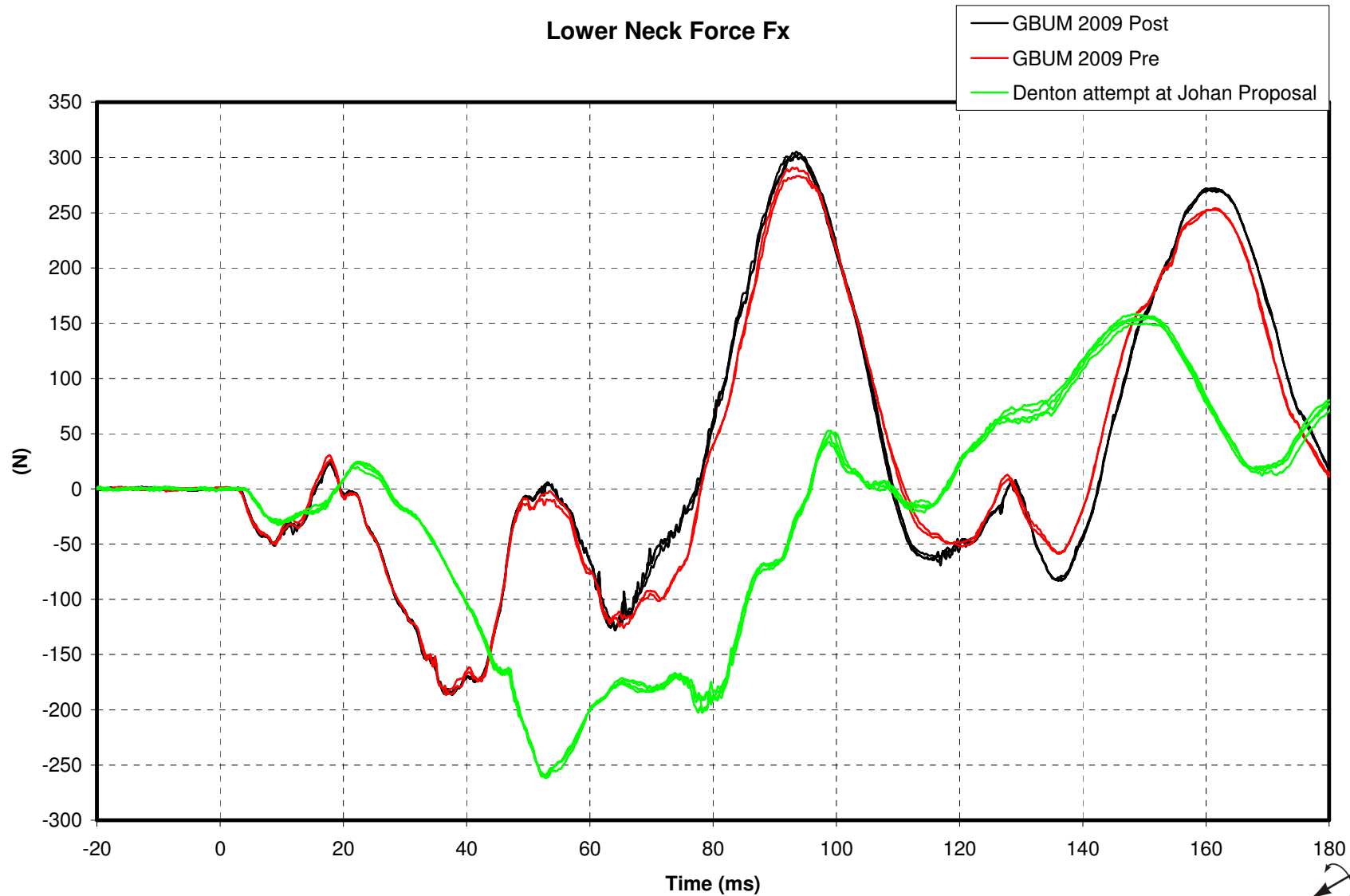
# Dummy Response to Johan Pulse



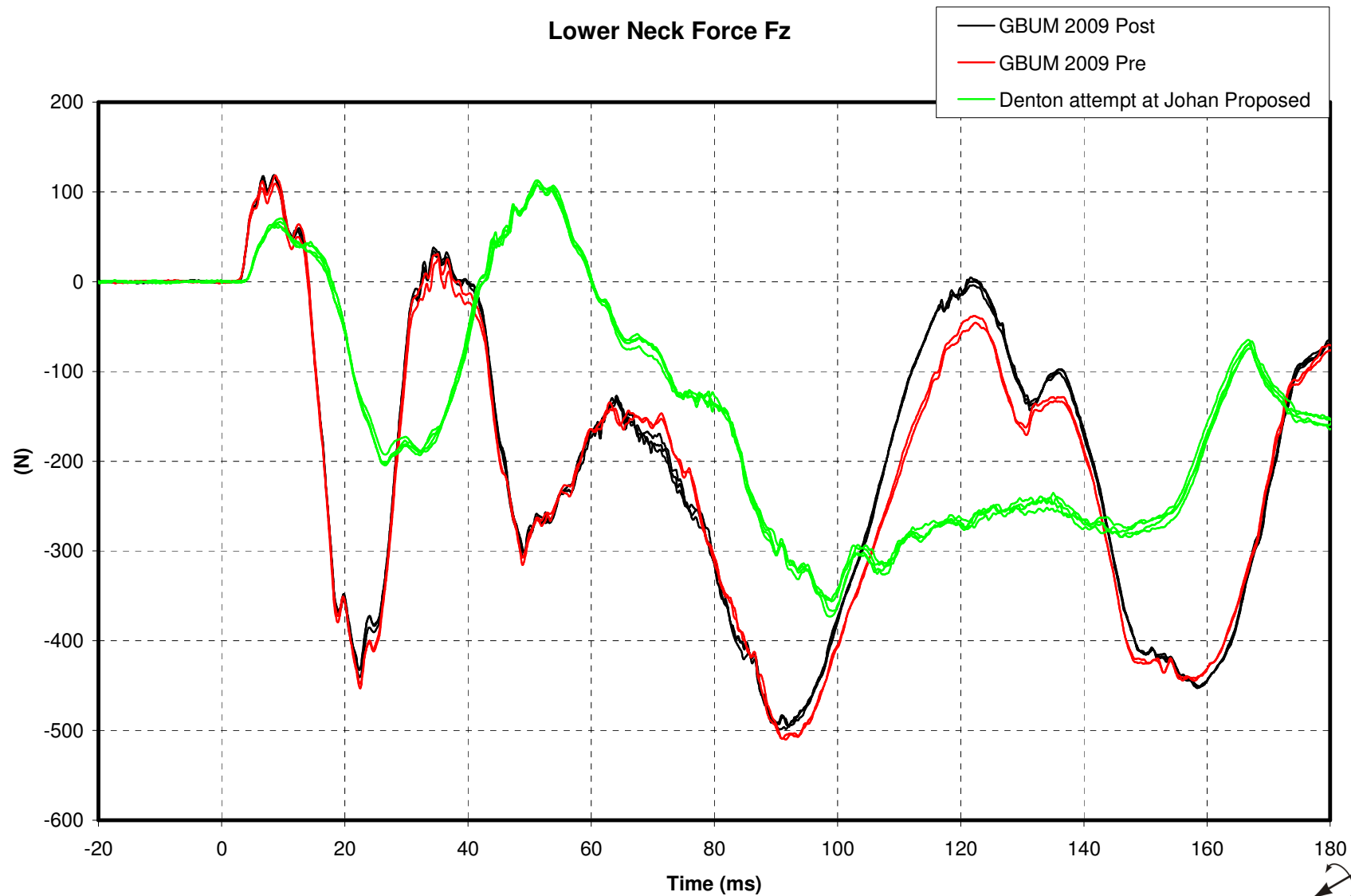
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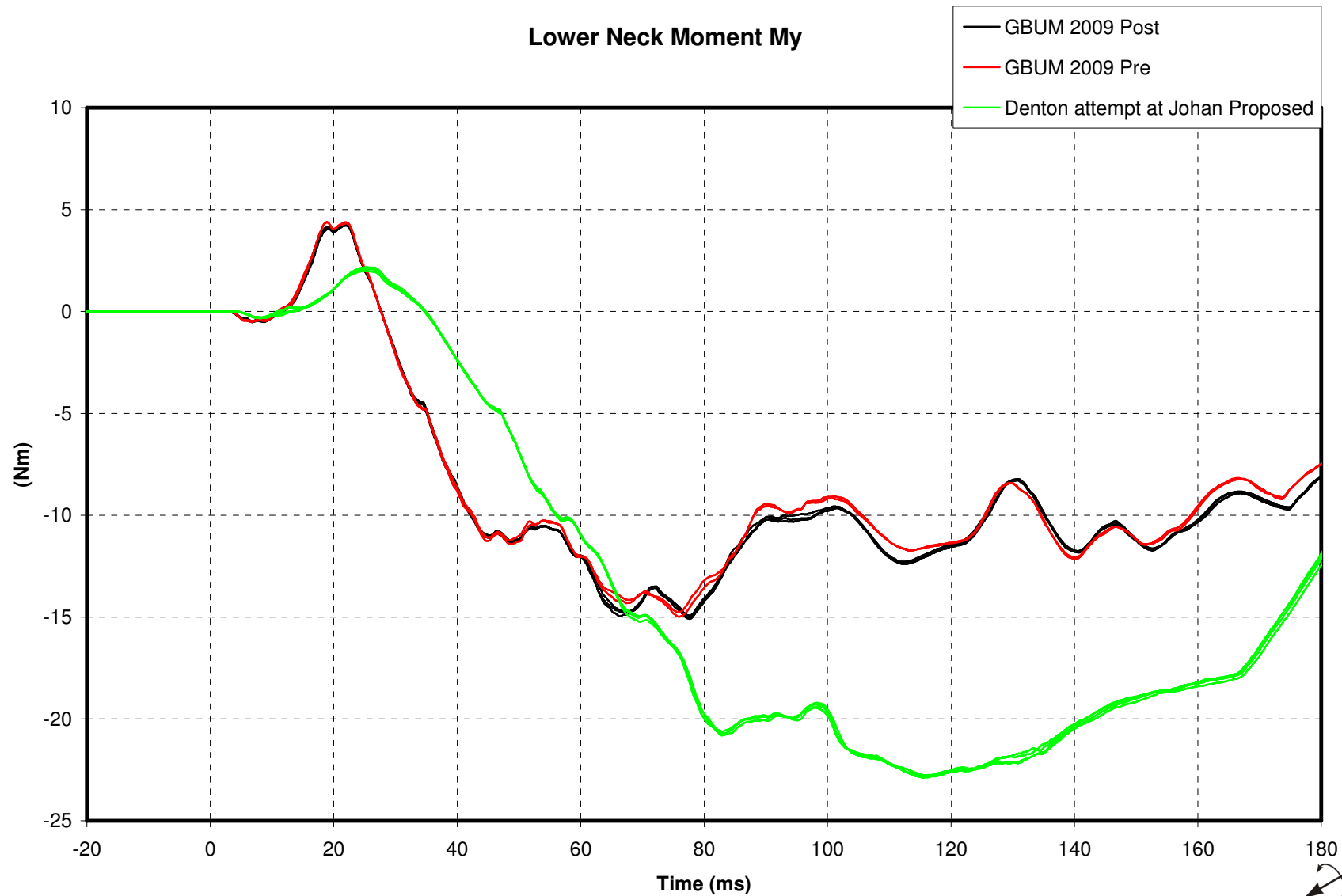
# Dummy Response to Johan Pulse



# Dummy Response to Johan Pulse



# Dummy Response to Johan Pulse



# Pros and Cons of Johan Proposal

- Pros
  - Energy levels more similar to car seat testing
    - Better discern differences between dummies?
  - Force curves with distinct peaks
    - See upper neck Fx, My & lower neck Fx, My
    - Much easier to create certification corridors



# Pros and Cons of Johan Proposal

- Cons
  - Take 2-3 months development to
    - Optimize pulse
    - Verify repeatability & reproducibility
    - Optimize dummy stop to protect dummy
    - Build upgrades for existing sleds and ship to Asia and Europe
  - Lose several months of data collection to create corridors



# Suggestions if Adopting Johan Proposal

- Continue testing as many dummies as possible with current GBUM 2009 test to
  - Identify dummies outside normal population
    - It has already shown better ability to discern dummy differences
  - Investigate why dummies are different once identified
- Continue to test effect of some tolerance issues suspected in drawings



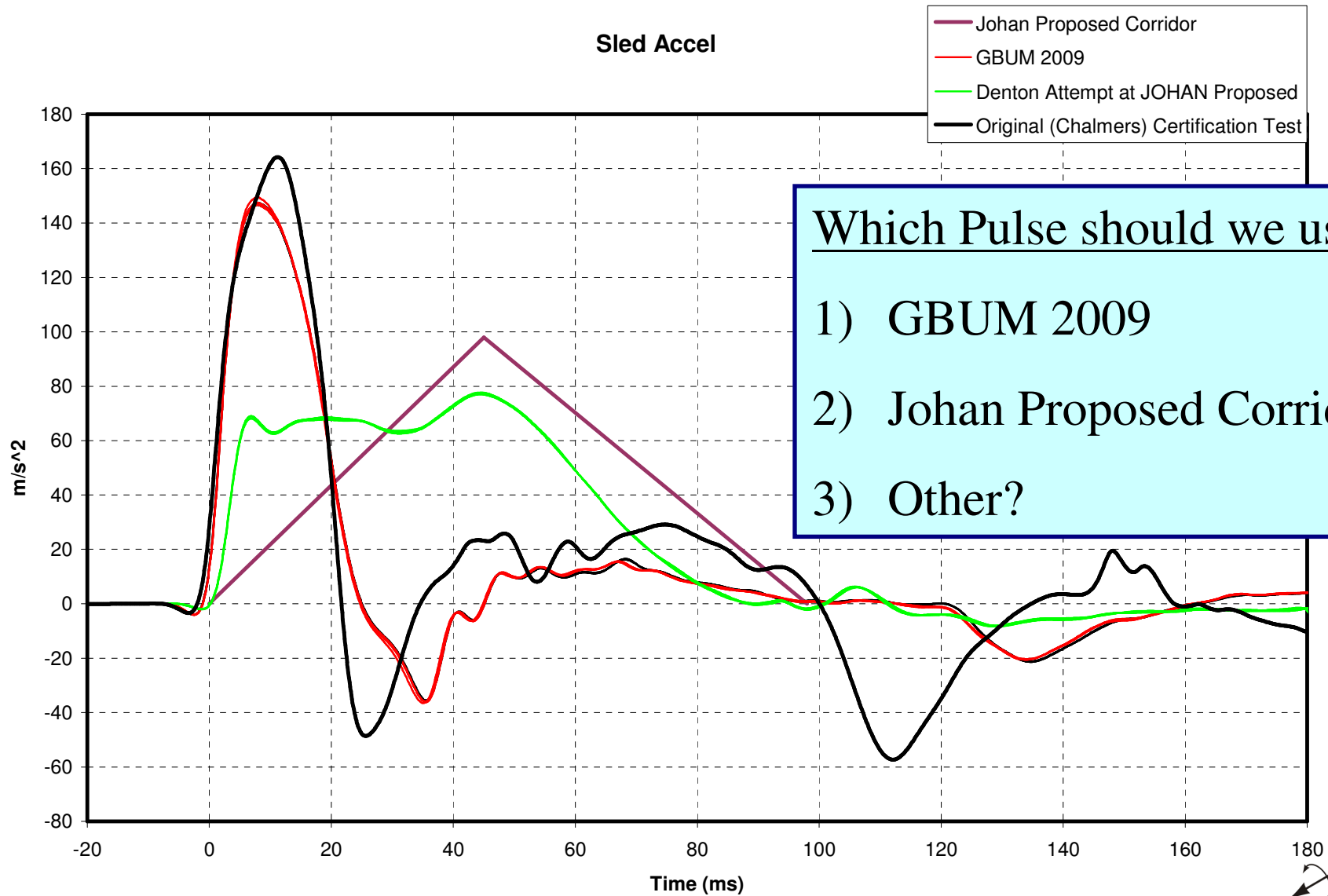


# Suggestions if Adopting Johan Proposal

- Once equipment is finished for new test
  - Pull and test dummies identified as different
    - From existing test
    - Car seat testing
  - Test as many dummies as possible
  - Run 2 or 3 dummies around labs for lab to lab round robin
  - Test any differences (such as jacket) identified with GBUM 2009 test



# Decision?



Which Pulse should we use?

- 1) GBUM 2009
- 2) Johan Proposed Corridor
- 3) Other?

THANK YOU  
for your attention

