

# **FIREARM EXAMINER COMPETENCE USING 3D IMAGING TECHNOLOGY**

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# OVERVIEW

Competency



Scope of 3D Imaging



Operator Variability



3D Competence Testing

# PROFICIENT

- Skilled & experienced

# COMPETENT

- Single skill or function
- Knowledge, abilities & attitudes
- Specific standard in specific conditions to do a job

# VALUE

# COMPETENCE TEST DESIGN



## Double blind

- Tester
- Testee



## Simulate casework

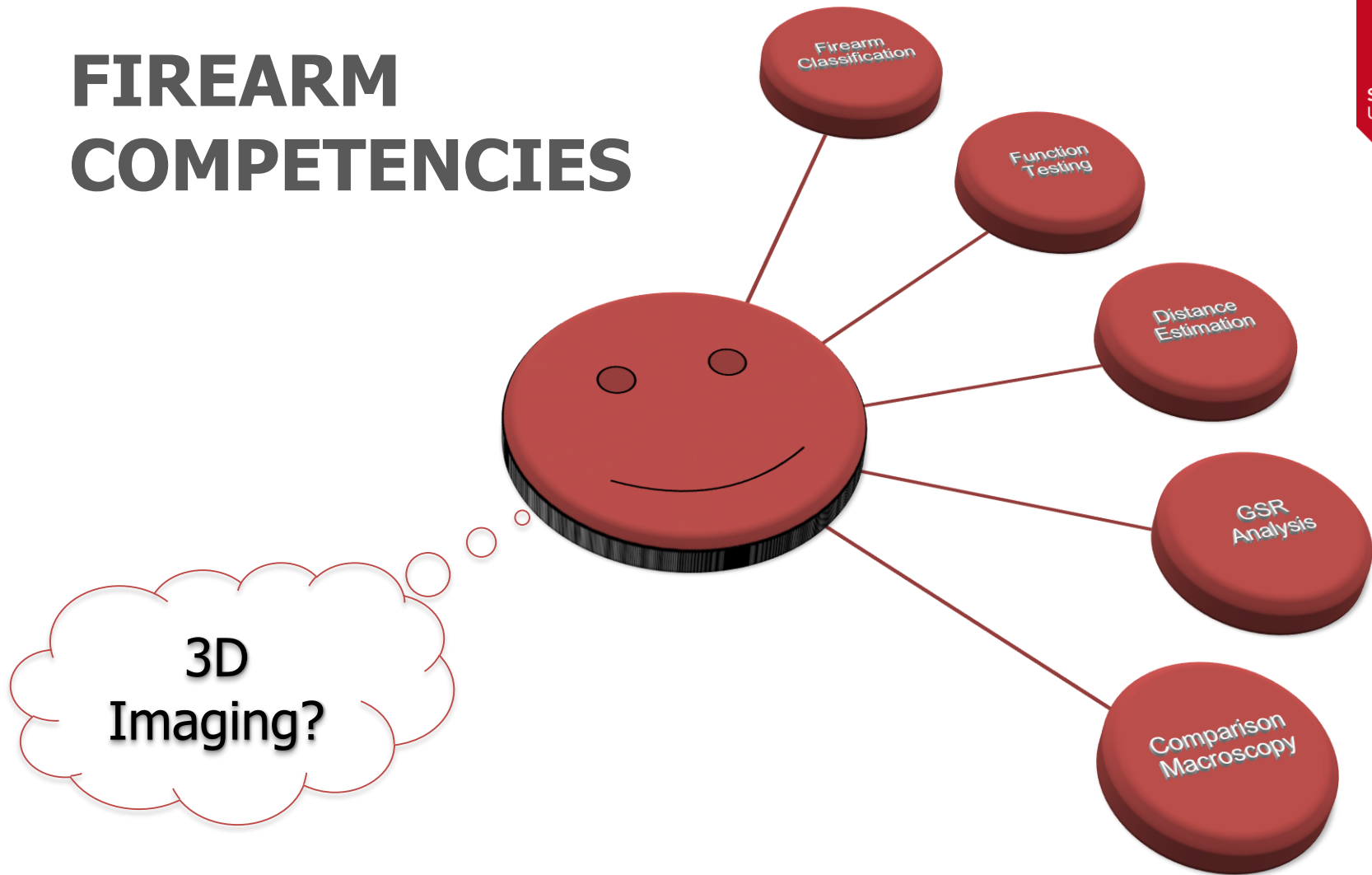
- 'No gun' case
- Range of answers (0 & >1)



## Peer-review protocol

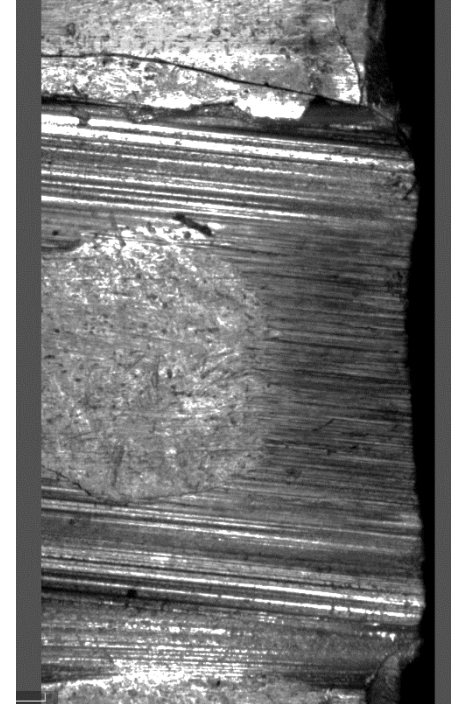
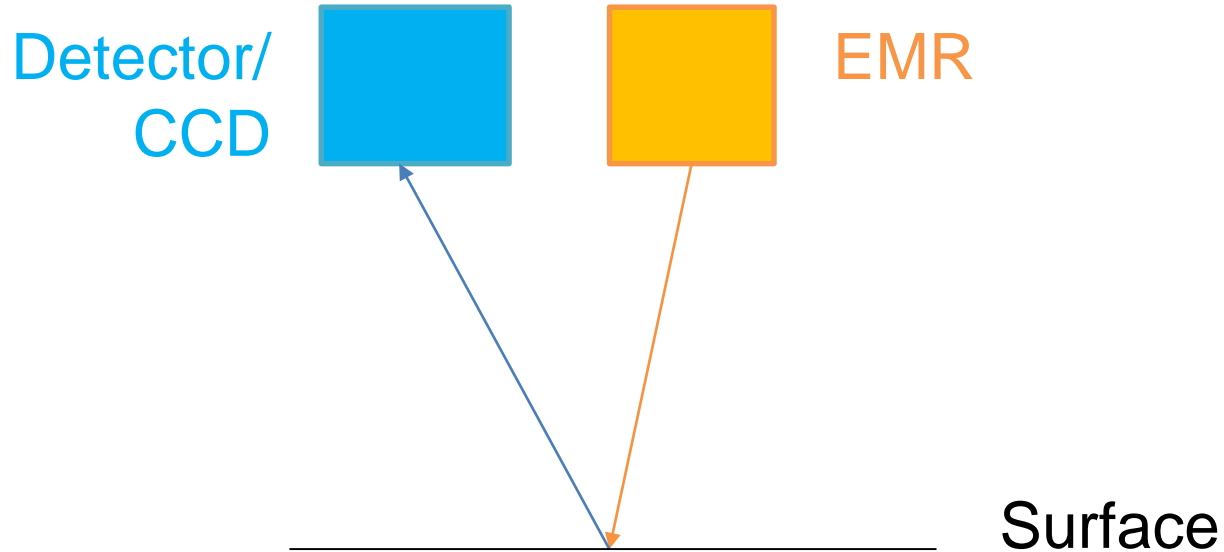
- Independent
- Range of conclusions

# FIREARM COMPETENCIES





# 3D IMAGING

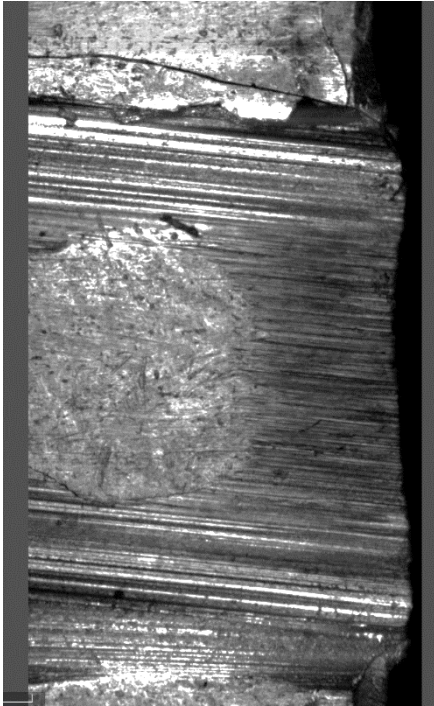




# SCOPE OF 3D IMAGING



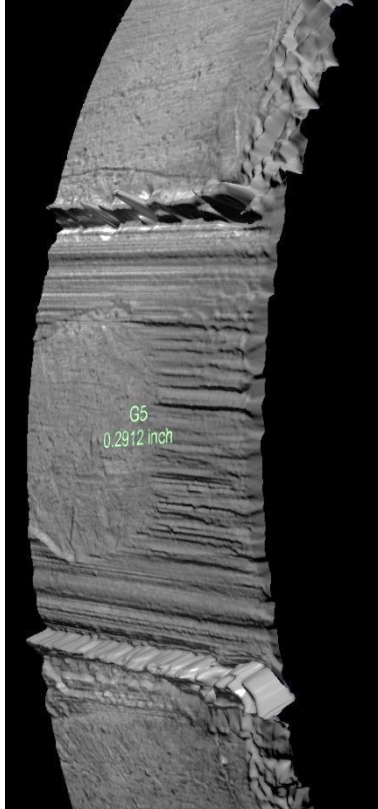
# AUTOMATED COMPARISONS



- Activity 1 (2D)
  - Pristine bullet
  - Conventional rifling
  - Identify the LEA
  - Draw anchor lines to outline the LEA:



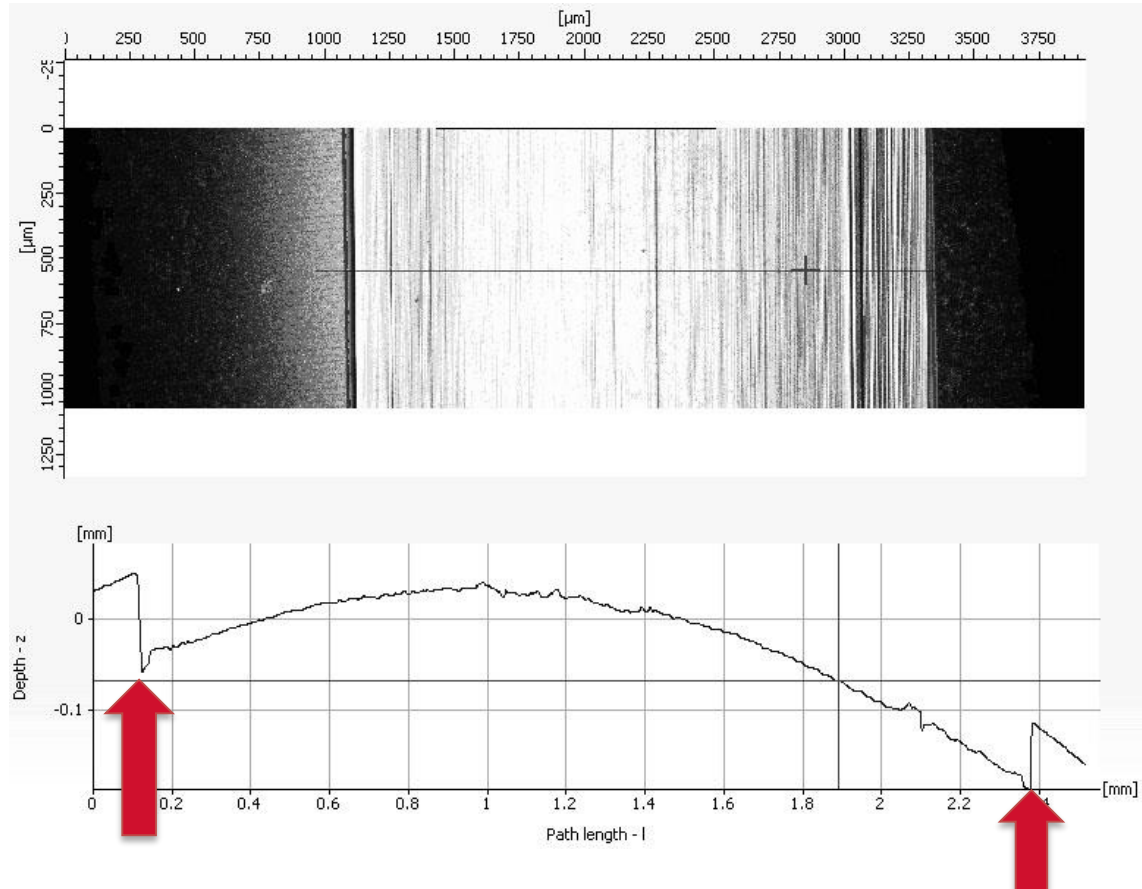
# AUTOMATED COMPARISONS



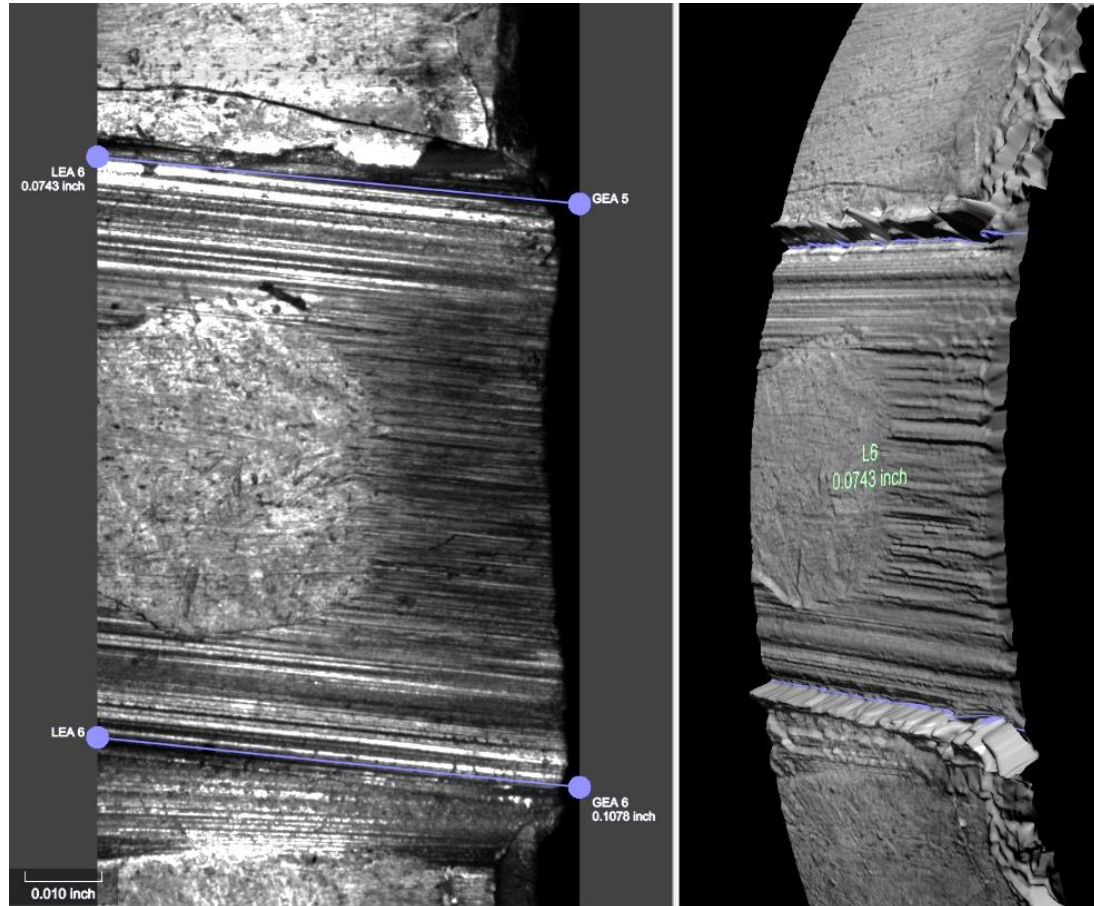
- Activity 2 (3D Shape)
  - Pristine bullet
  - Conventional rifling
  - Identify the LEA
  - Draw anchor lines to outline the LEA:



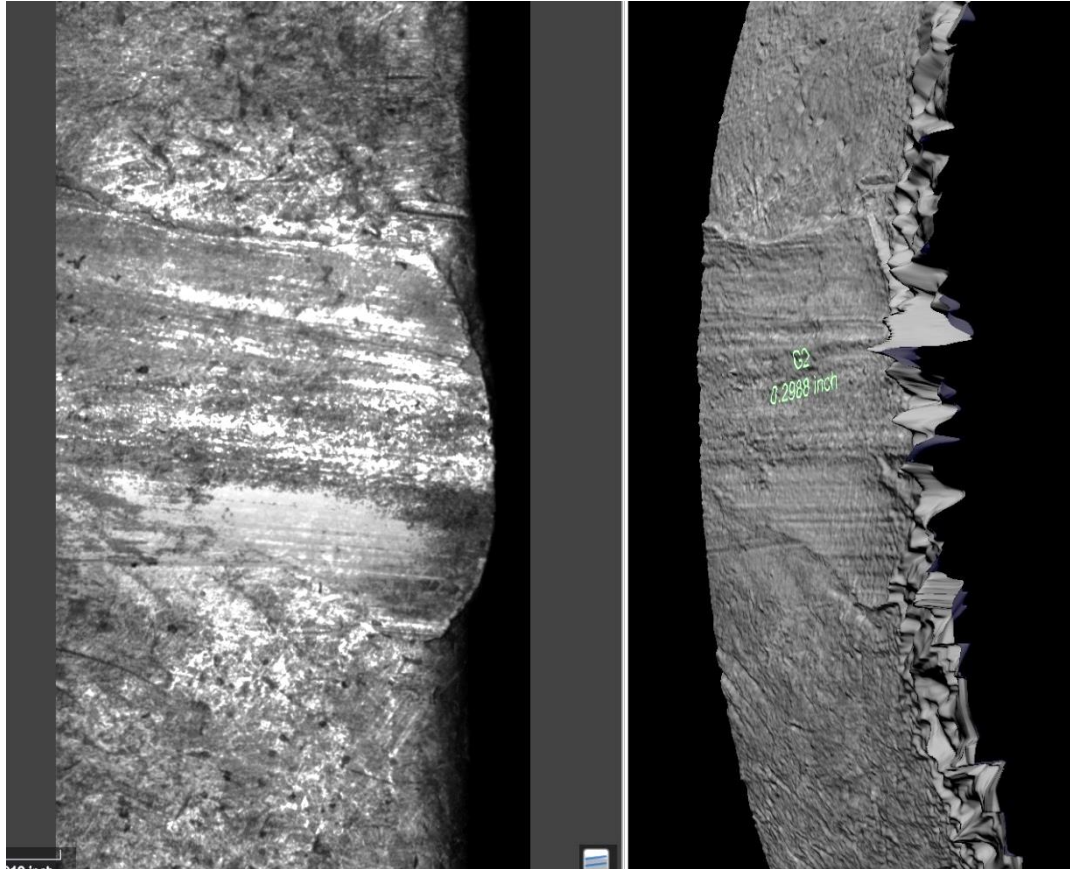
# ANCHOR LINES



# AUTOMATED COMPARISONS



# AUTOMATED COMPARISONS



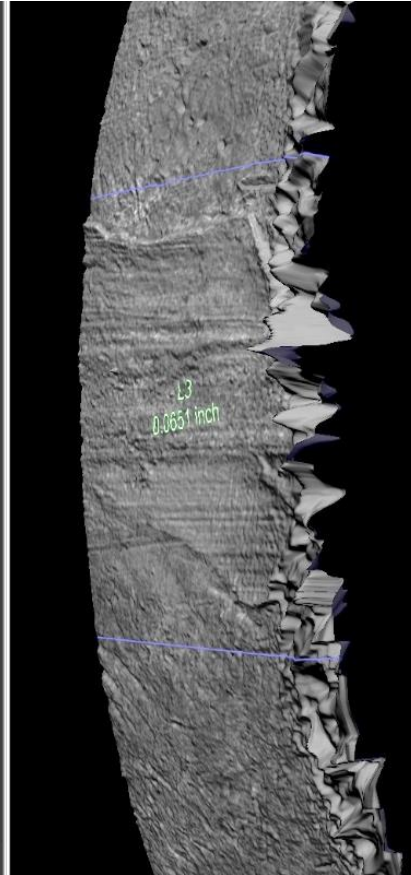
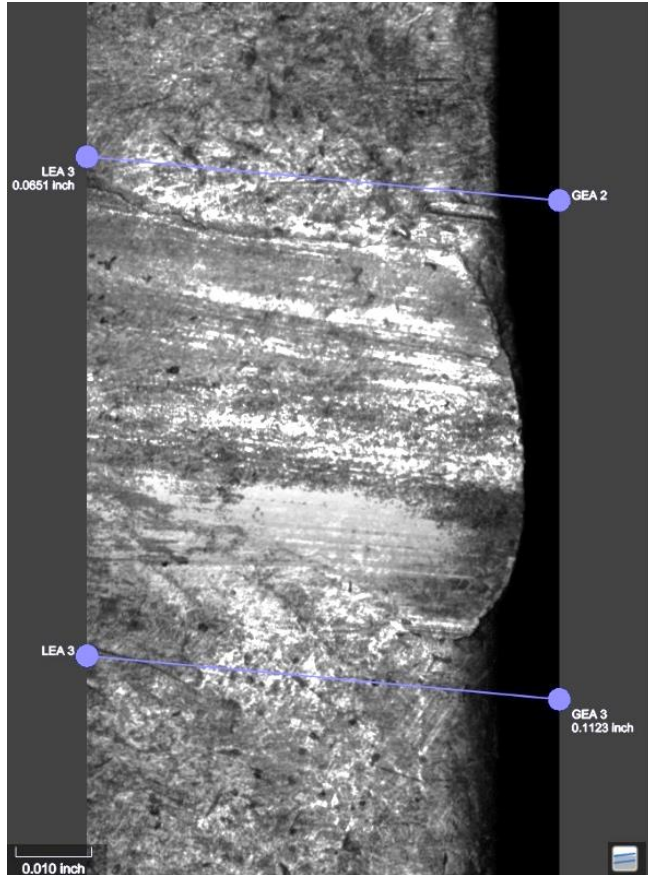
- Activity 3 (Combined)
  - Pristine bullet
  - Glock rifling
  - Identify the LEA
  - Draw anchor lines to outline the LEA:

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# AUTOMATED COMPARISONS



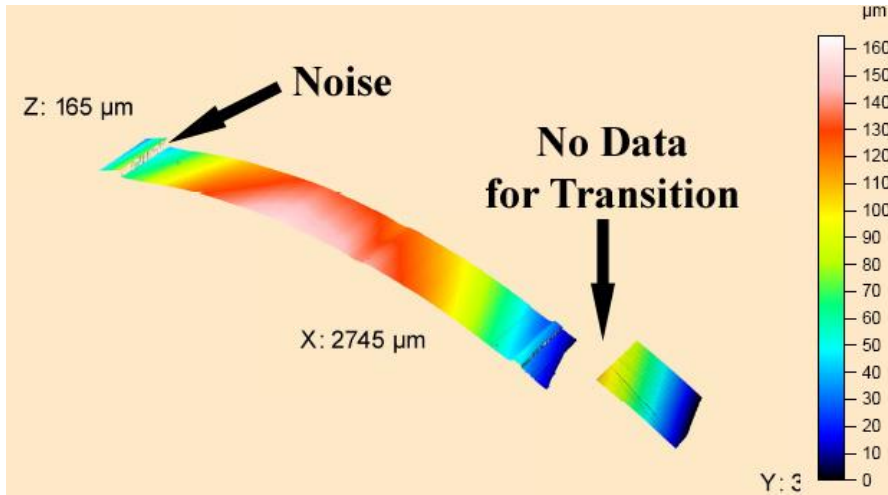
- Activity 3 (Combined)
  - Pristine bullet
  - Glock rifling
  - Anchor lines outline LEA

# HUMAN VARIABILITY



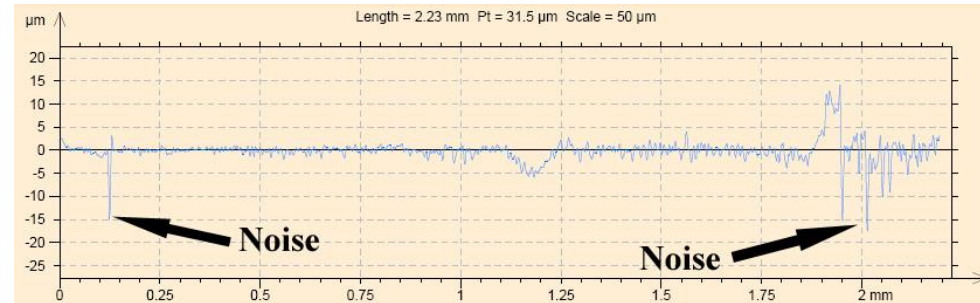
# **SPEED OF INTELLIGENCE**

# IMAGING CONSIDERATIONS



**Steep slopes**

**Noise**



Bolton-King, RS et al. (2010). What are the prospects of 3D profiling systems applied to firearms and toolmark identification? *AFTE Journal*, 43(1), p23-33.

# 3D IMAGING COMPETENCY?

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