

Supplementary Material (Document Title: S2)

Article Title:

Systematizing Data Preparation in Smart Manufacturing via Axiomatic Design: A Toolkit Integrating GUI and Agentic AI

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Description:

This document details the application scenario of the GUI-based toolkit by providing visual screenprints.

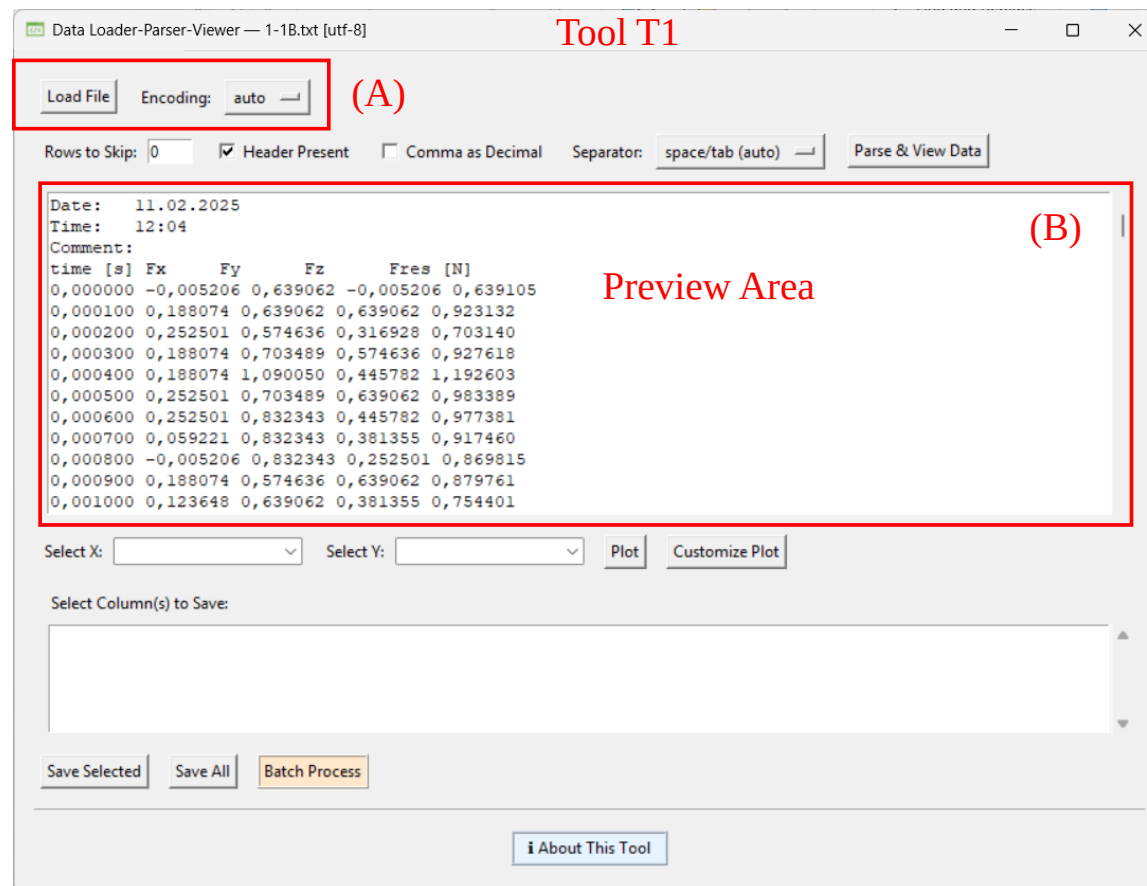


Figure S2-1. Loading and viewing a file using tool T1.

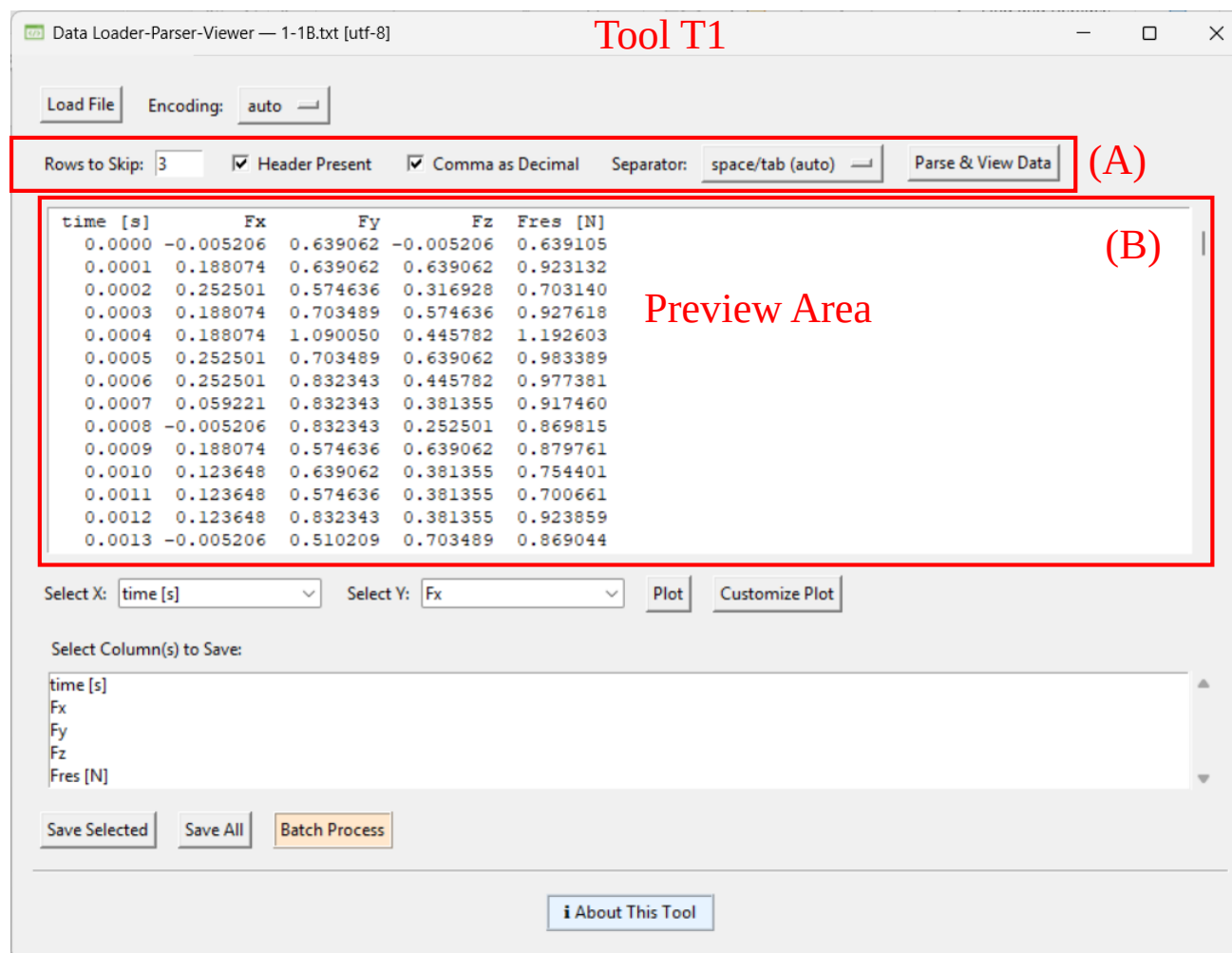


Figure S2-2. Parsing a file using tool T1.

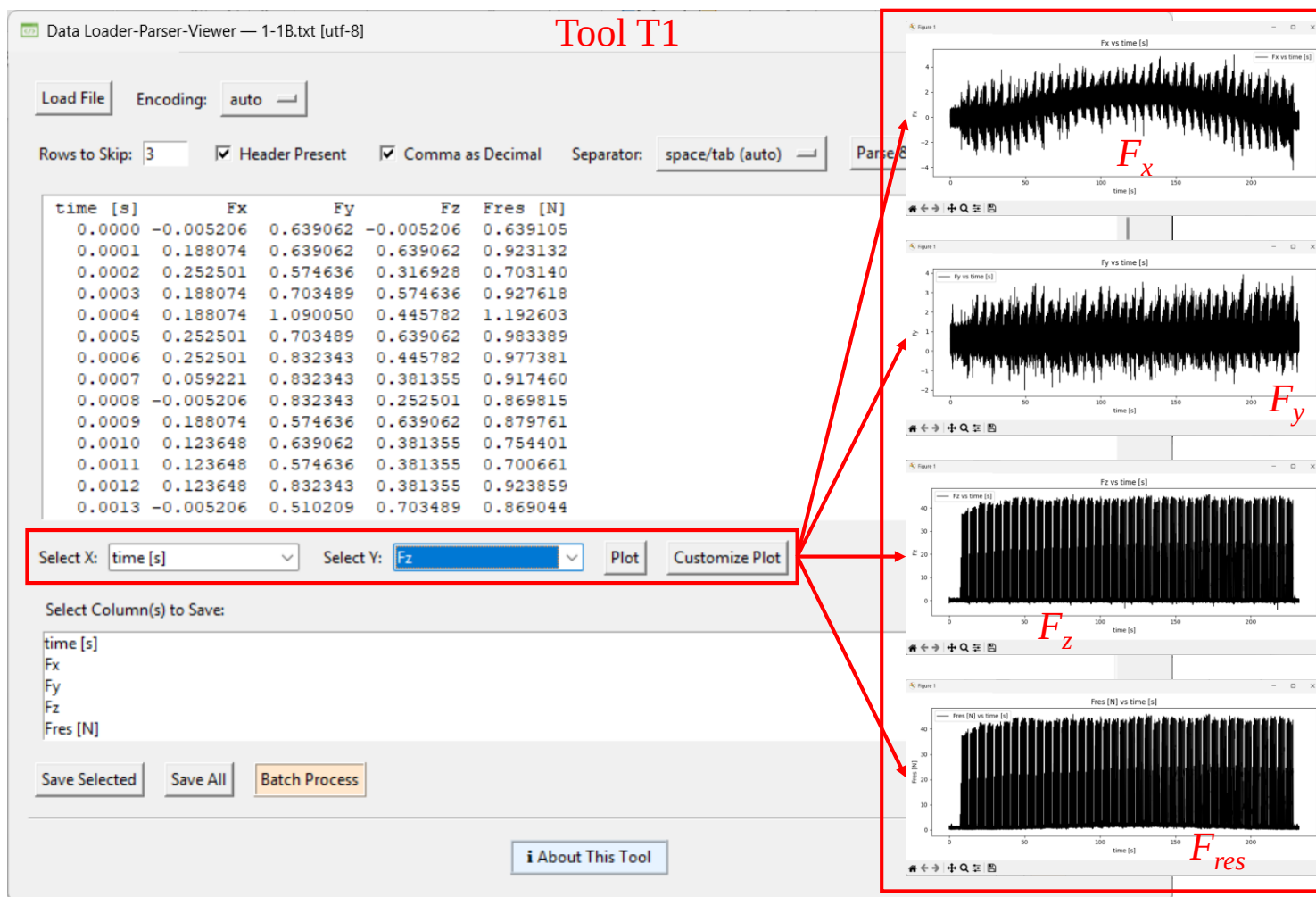


Figure S2-3. Visualizing data using tool T1.

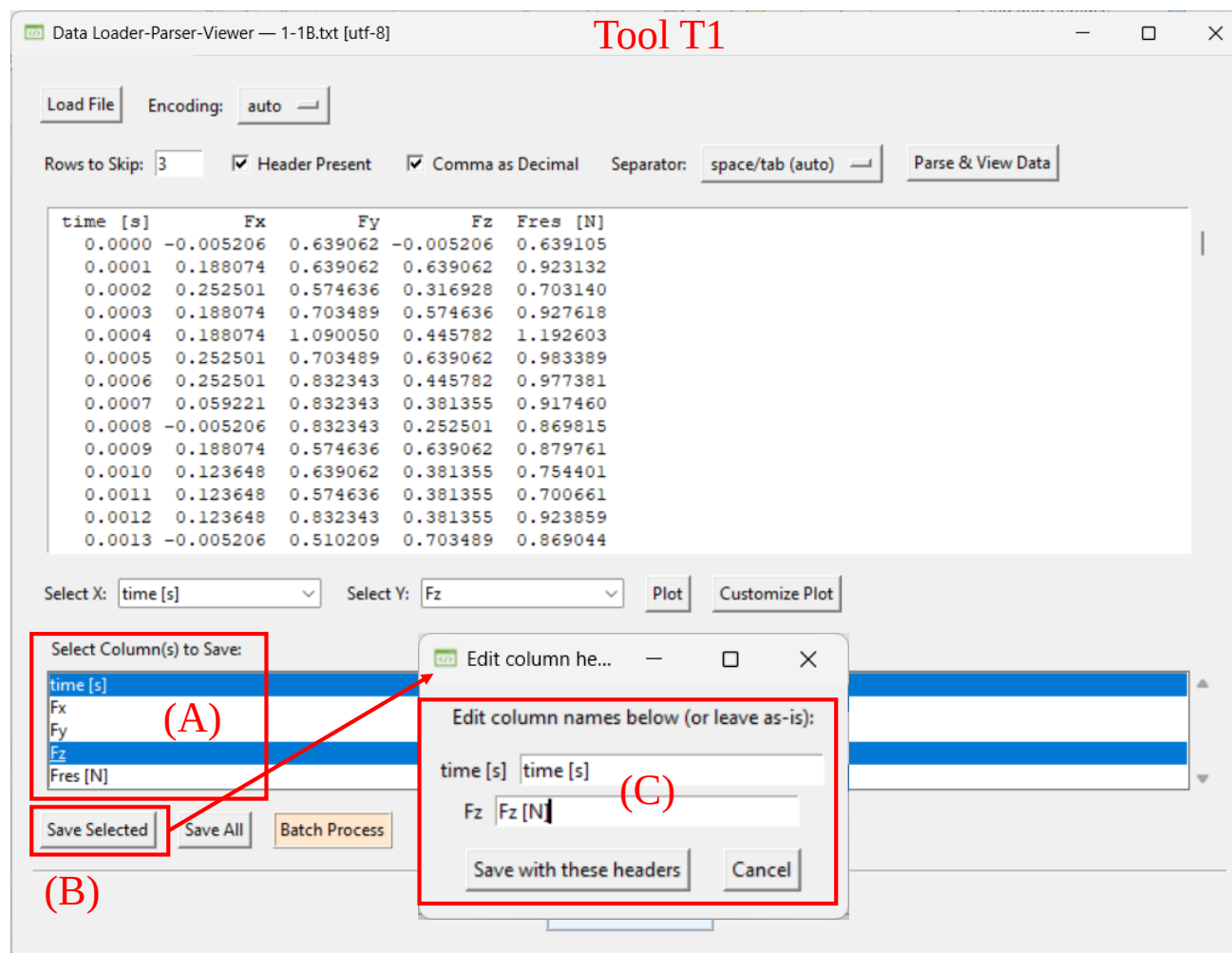


Figure S2-4. Saving relevant data using tool T1.

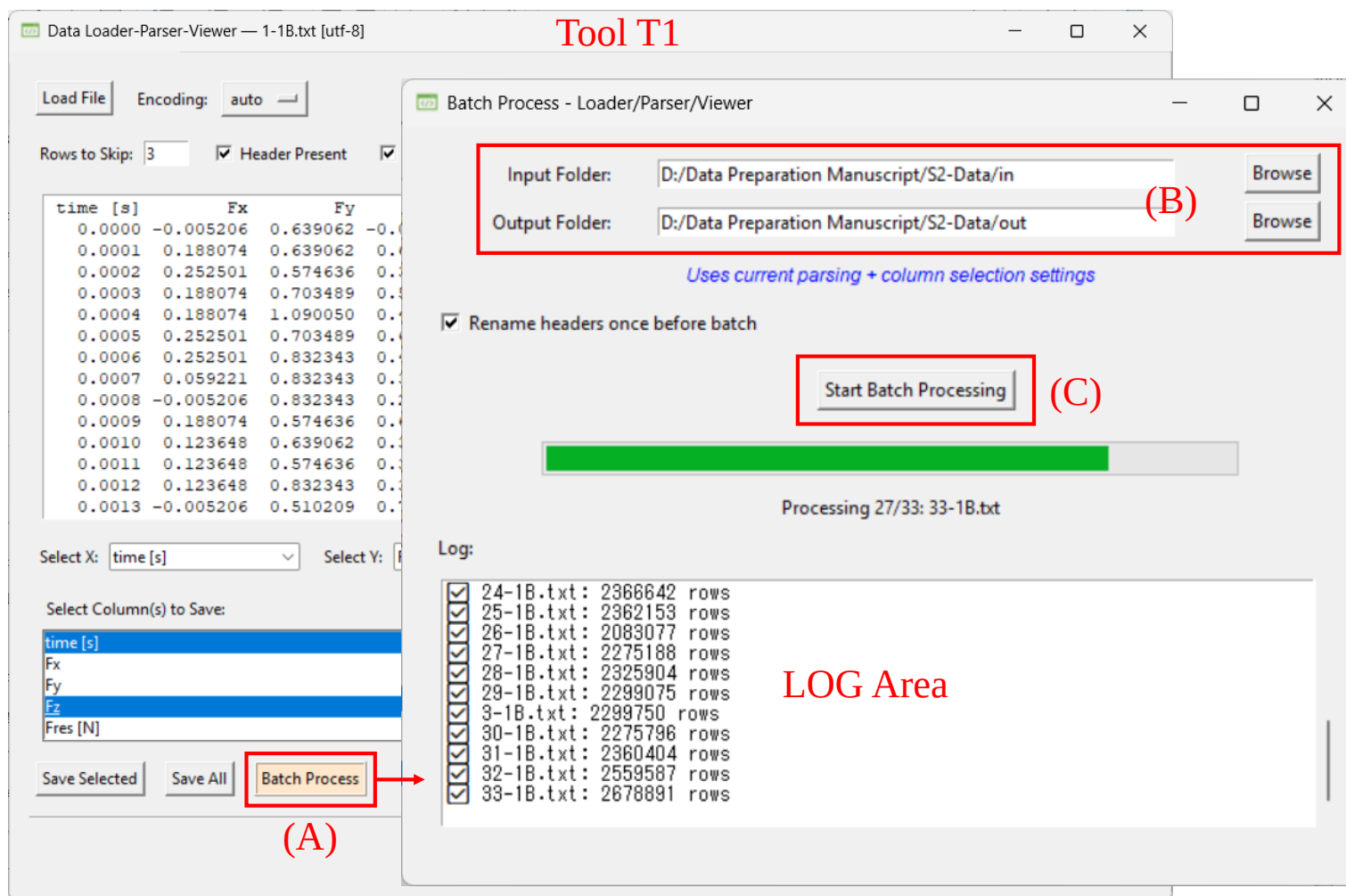


Figure S2-5. Batch-processing files using tool T1.



Figure S2-6. Segmenting data using tool T2.

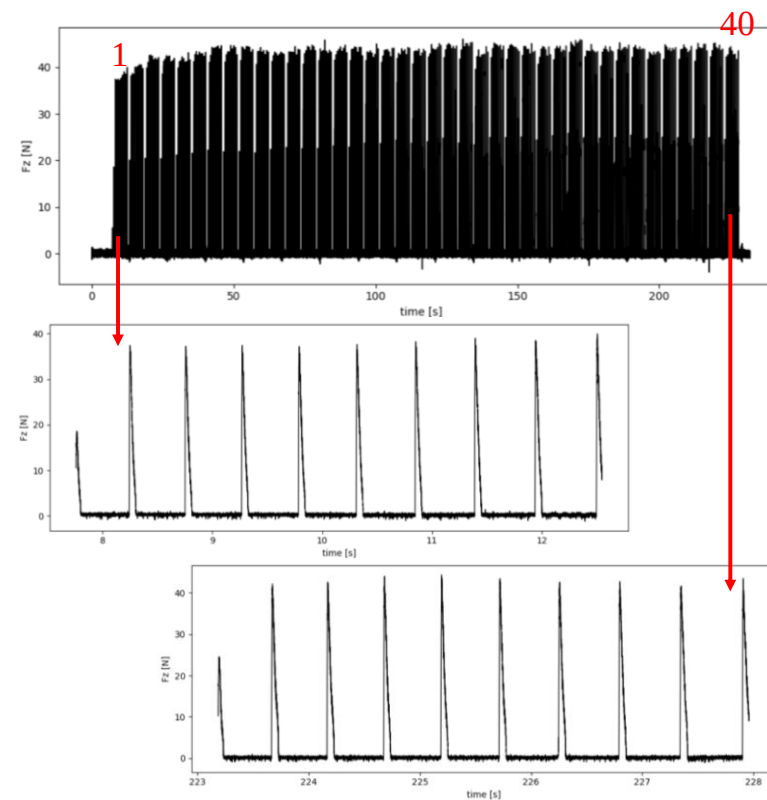
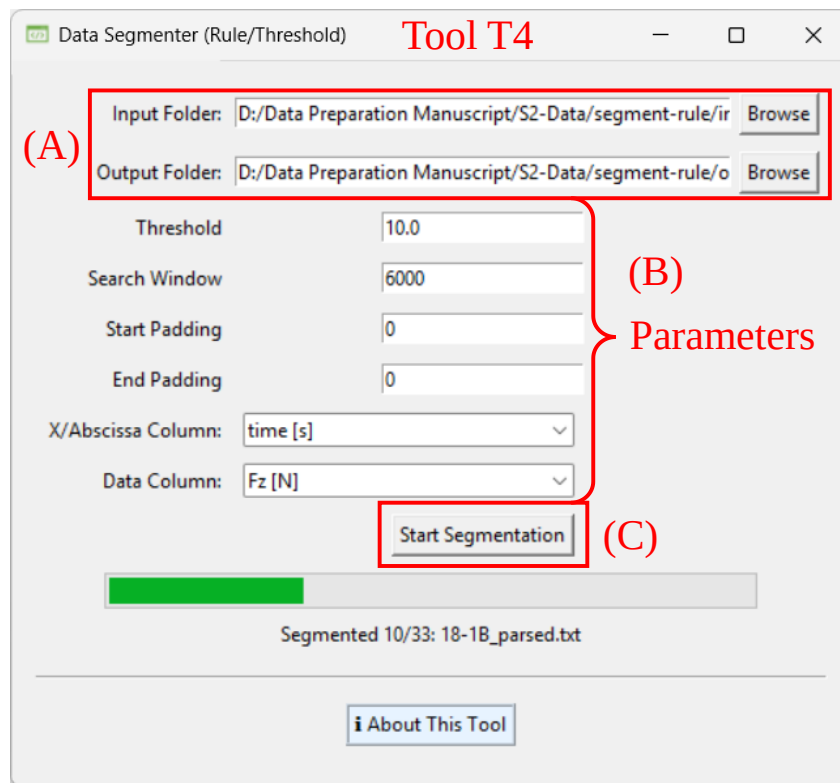


Figure S2-7. Segmenting data using tool T4.

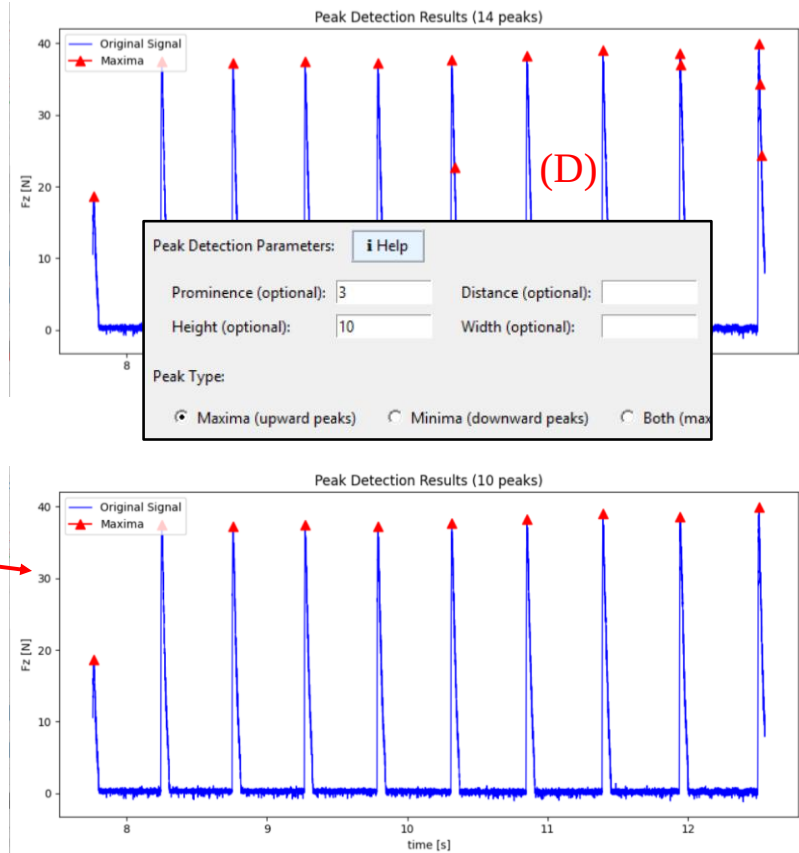
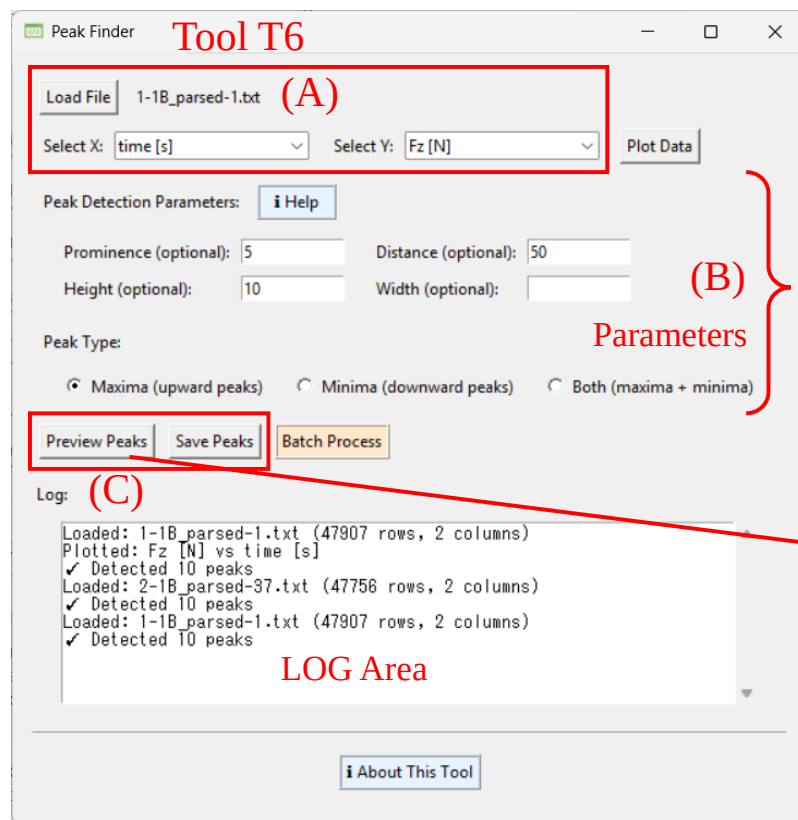


Figure S2-8. Feature-based resampling using tool T6.

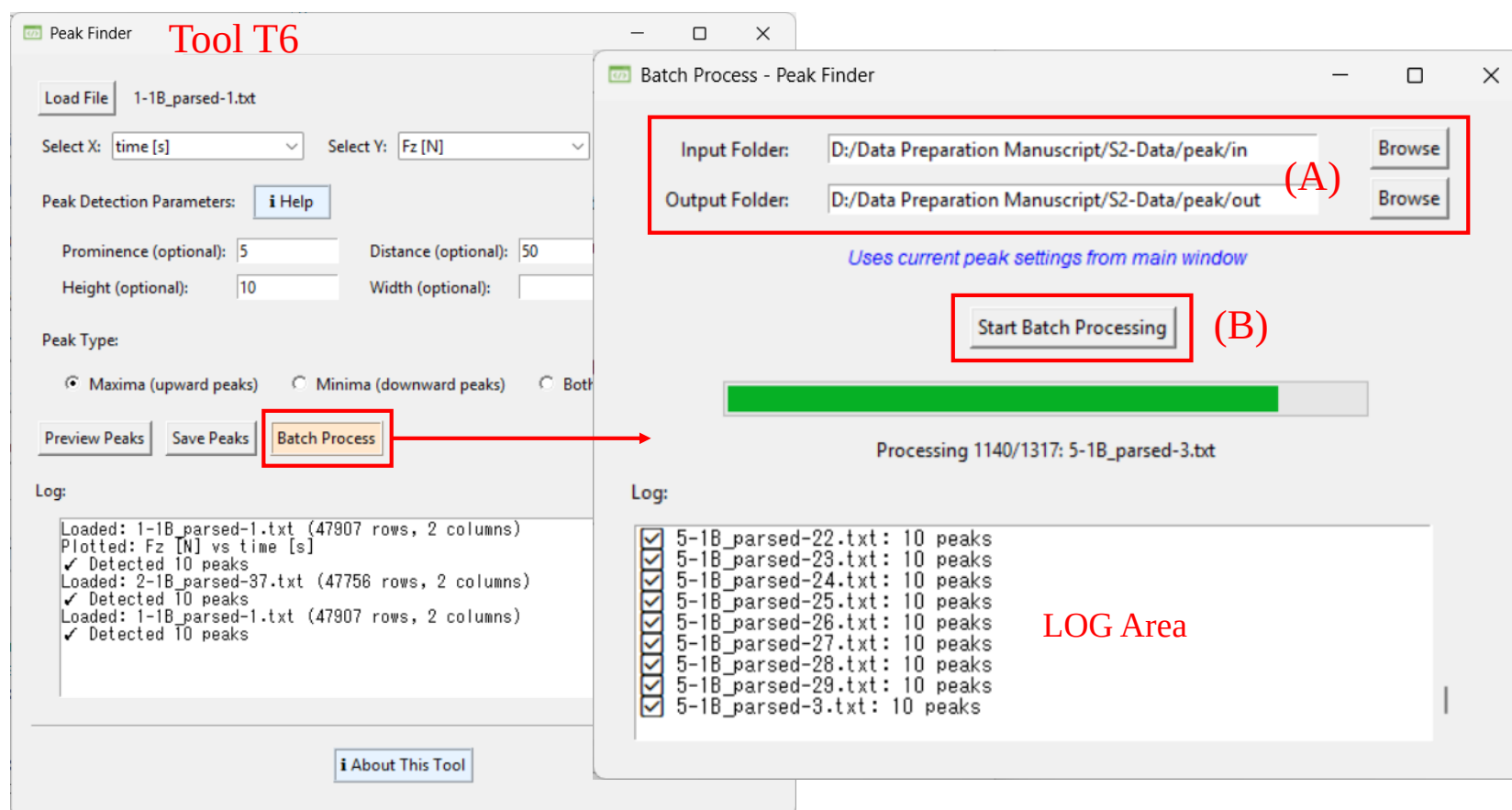


Figure S2-9. Batch-processing files using tool T6.

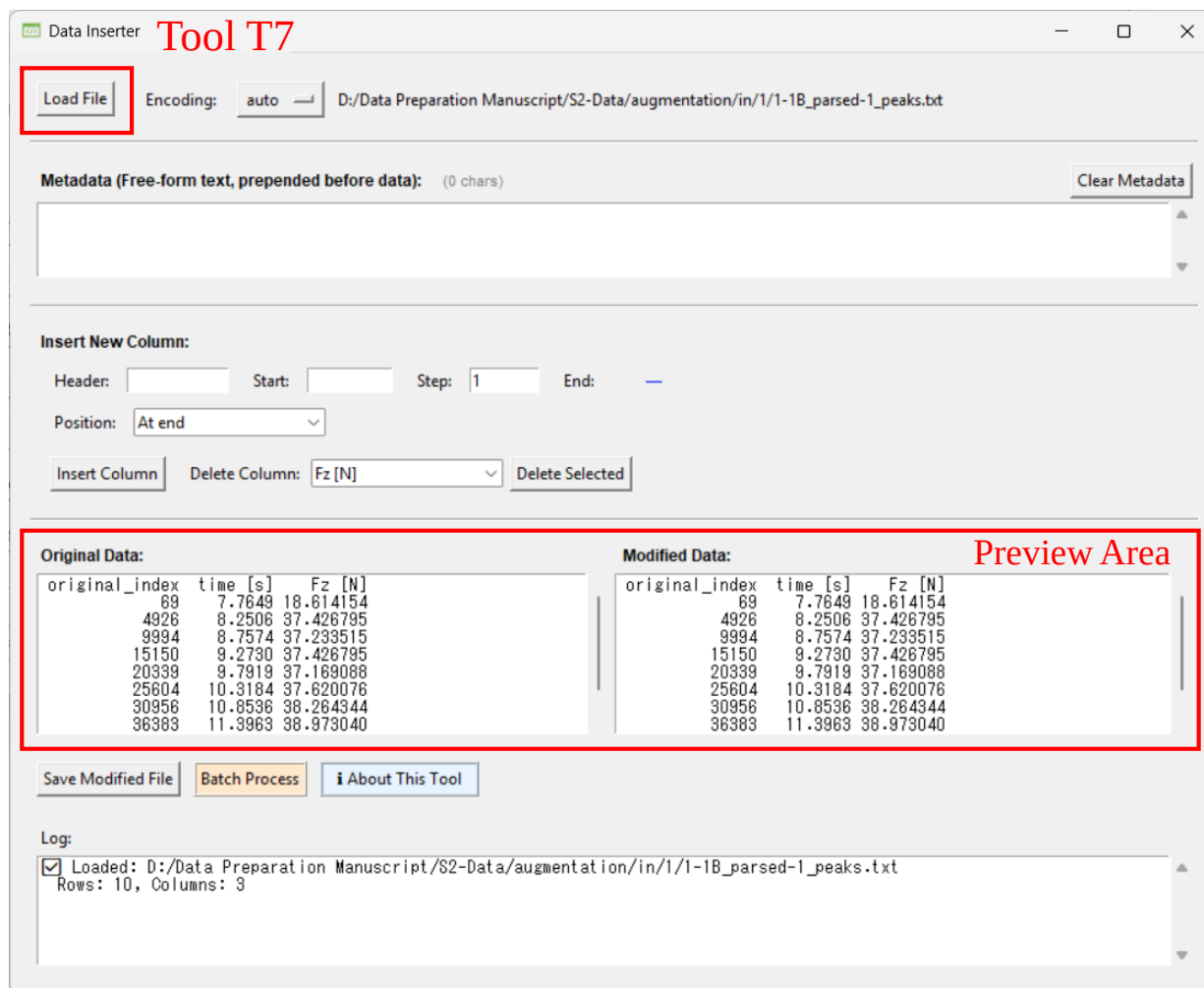


Figure S2-10. Loading and viewing a file using tool T7.

Data Inserter
Tool T7

Load File
Encoding: auto
D:/Data Preparation Manuscript/S2-Data/augmentation/in/1/1-1B_parsed-1_peaks.txt

Metadata (Free-form text, prepended before data): (109 chars, 4 lines)
Clear Metadata

Process: Micro Drilling
Tool: Solid Carbide micro-INOX 8xD drill
Workpiece: Titanium Block (Ti6Al4V)
Cycle: 1

Insert New Column:

Header: i Start: 1 Step: 1 End: 10.00

Position: At start Will generate 10 values

Insert Column Delete Column: Fz [N] Delete Selected

Original Data:

Modified Data:

Preview Area

Save Modified File Batch Process About This Tool

Log:

☒ Loaded: D:/Data Preparation Manuscript/S2-Data/augmentation/in/1/1-1B_parsed-1_peaks.txt
☒ Rows: 10, Columns: 3
☒ Column original_index deleted
☒ Column time [s] deleted
☒ Column i inserted: 10 values from 1.0 to 10.00 (step 1.0)

Figure S2-11. Data augmentation using tool T7.

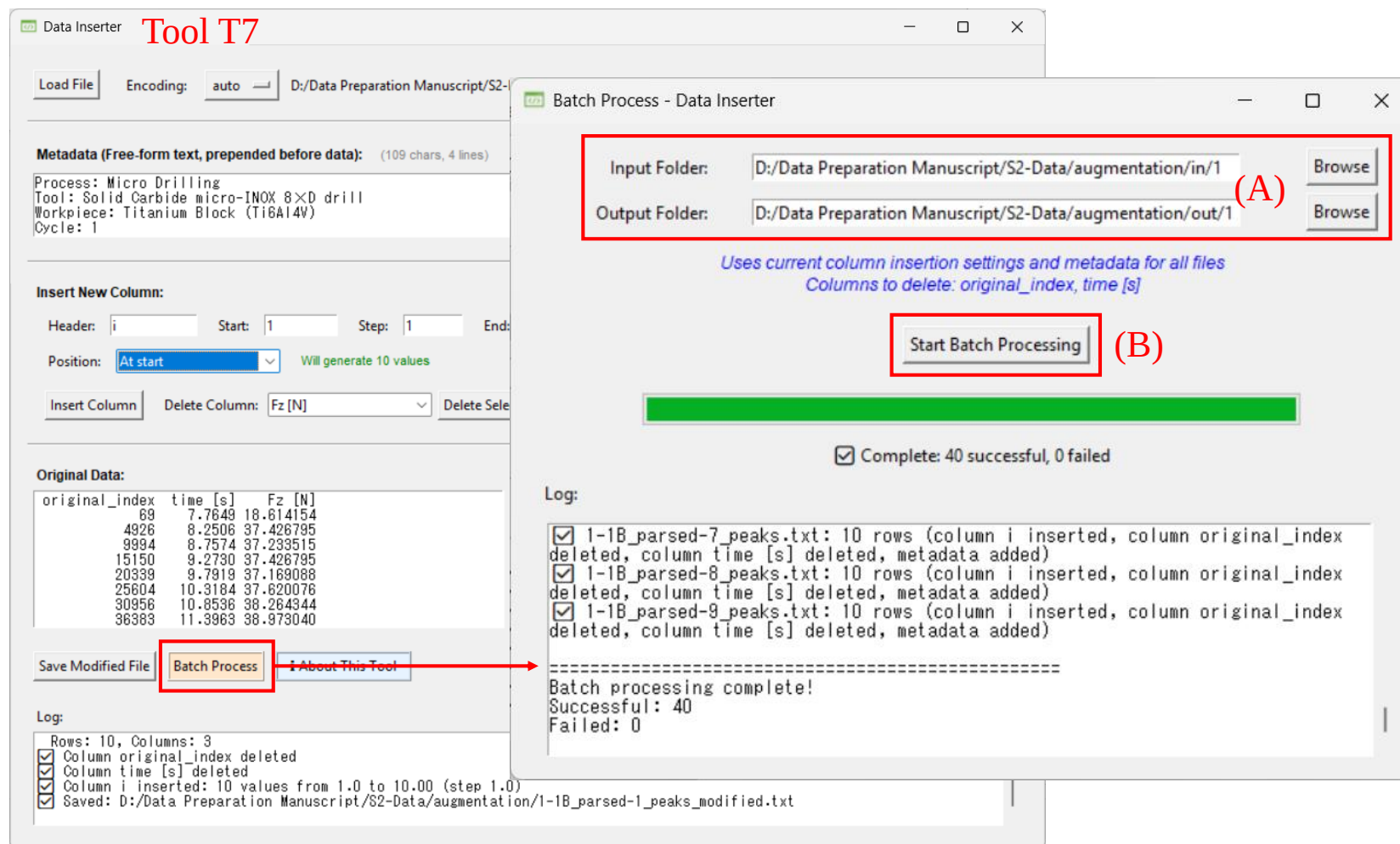


Figure S2-12. Batch-processing files using tool T7.

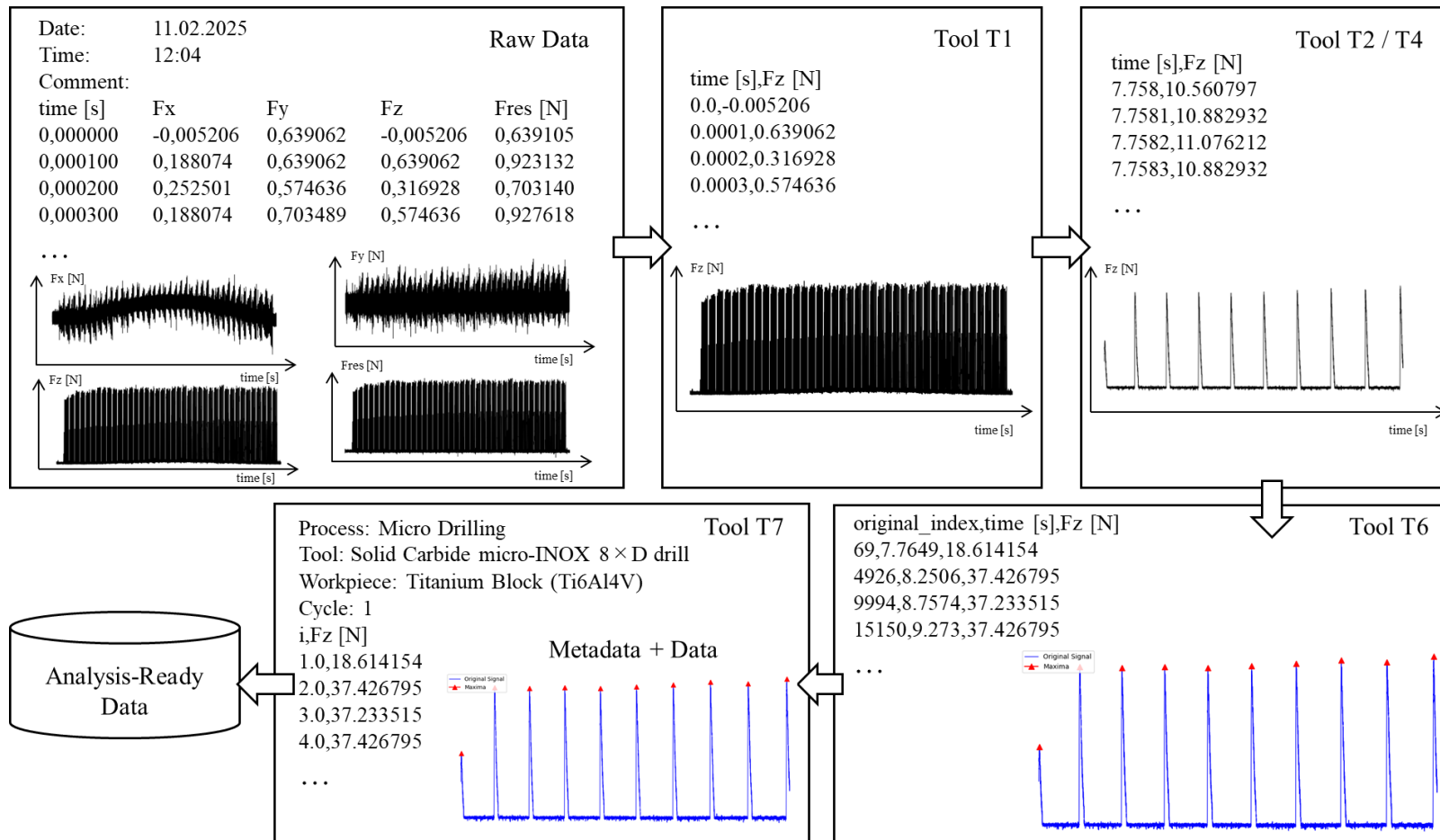


Figure S2-13. Summarizing the above workflow using the GUI-based toolkit.