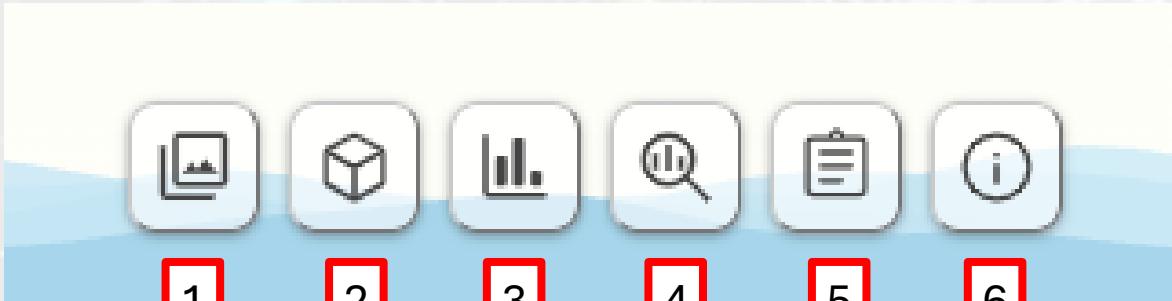


ANNEX B - USER MANUAL

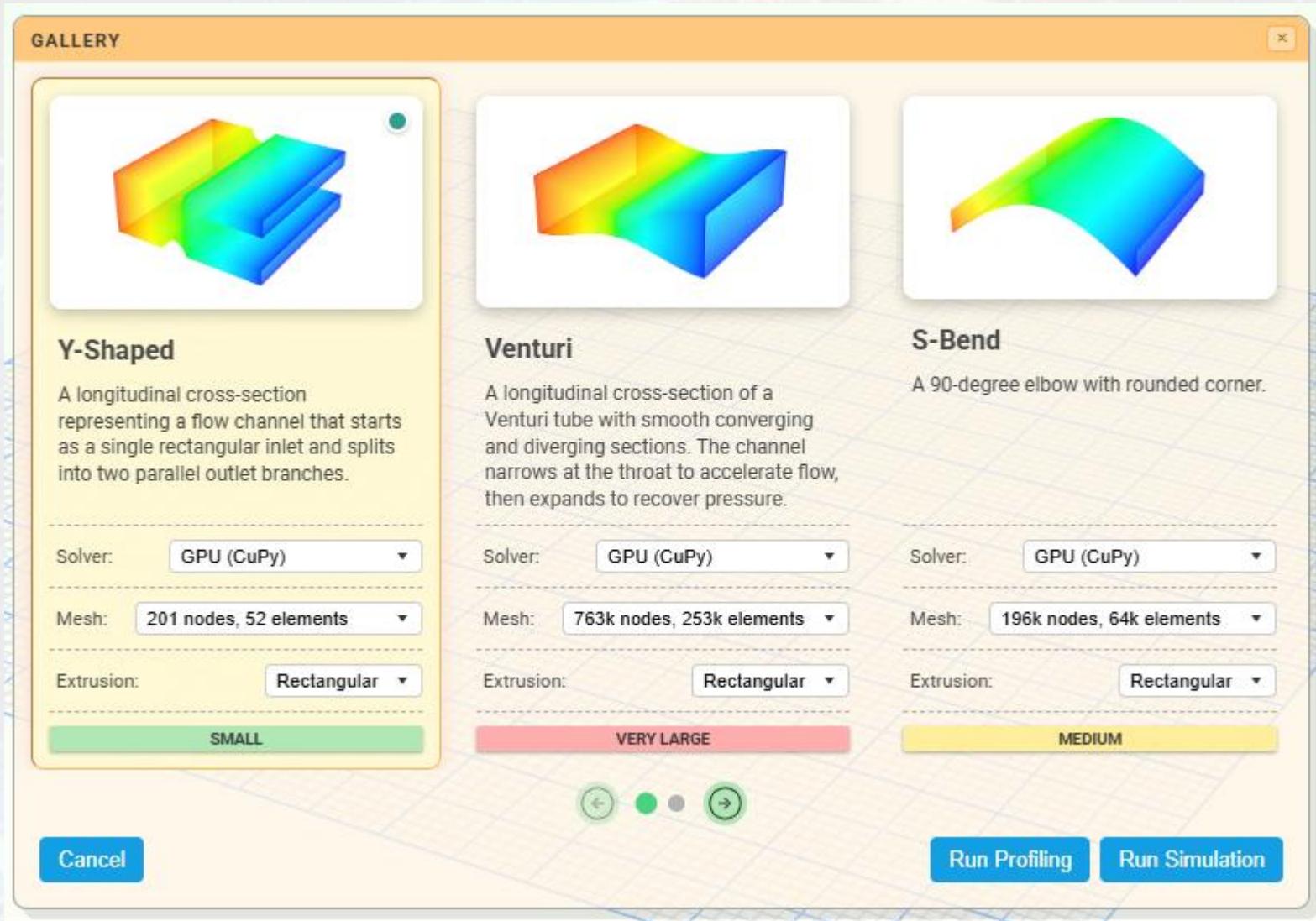
FEMulator Pro

Control Buttons

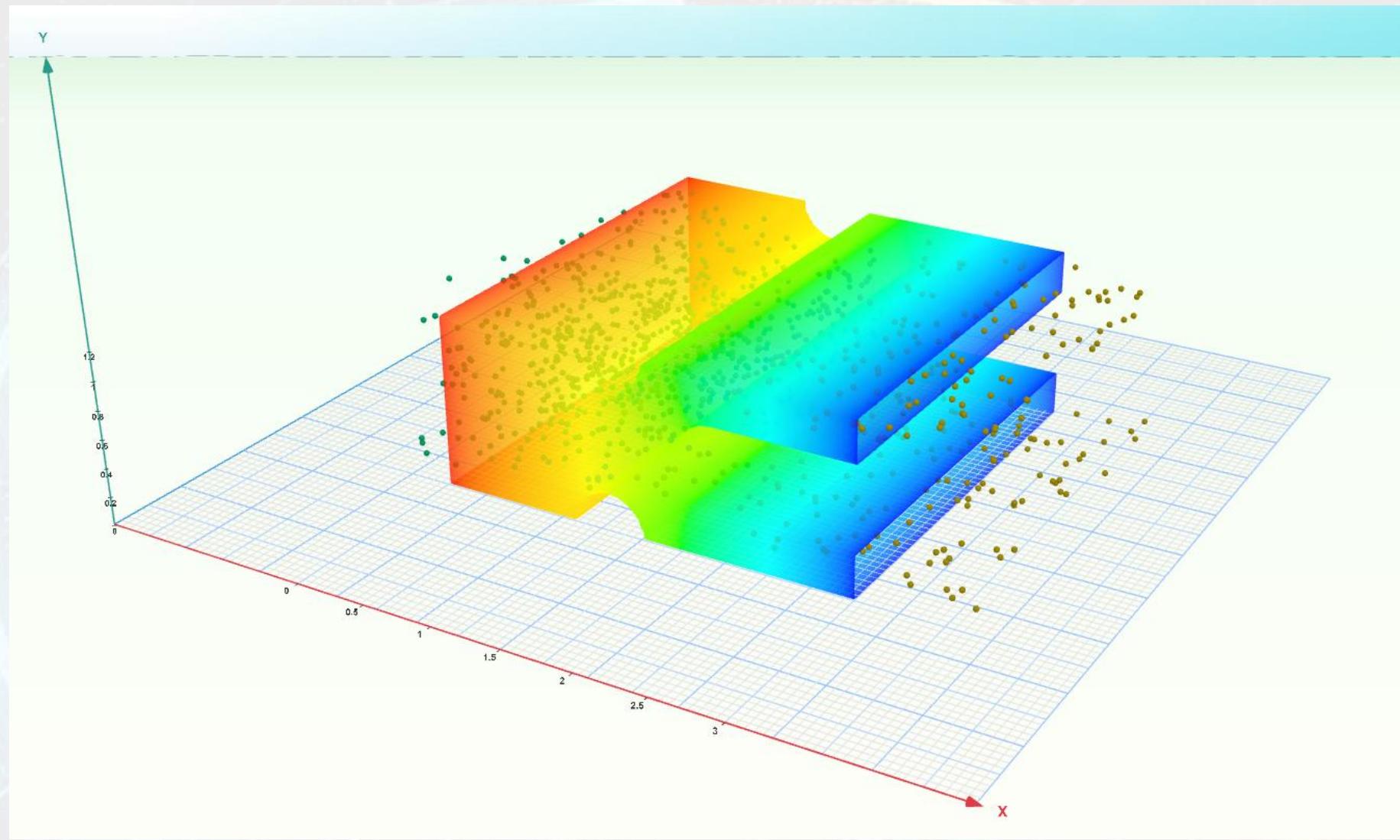


- 1 Mesh Gallery
- 2 Simulation Details, Metrics & Settings
- 3 Benchmark & Simulations History
- 4 Profiling Sessions
- 5 Reporting
- 6 About

1 – Mesh Gallery



1 – Simulation



2 – Simulation Details, Metrics & Settings

SIMULATION

Details Metrics Settings

Model: Y-Shaped

Mesh: 195k nodes, 48k elements

Solver: GPU (CuPy)

Status: Ready

Current Stage: Post-Processing

Convergence Trend (Log Scale):



Residual: **2.325e-9**

Progress: **7.4%**

Iteration: **3700 / 50000**

Nodes / Elements: **195,853 / 48,607**

ETR: **0m 16s**

Total Time: **0m 4s**

Clear Scene **Close**

SIMULATION

Details Metrics Settings

Solver 0/4

Convergence Iterations Residual vs iteration chart (log scale) **LIVE**

Convergence Quality Final residual, iterations, convergence status **POST**

Timing Breakdown Time spent in each solver stage **POST**

Speedup Factors Performance comparison across solver types **POST**

Model 0/2

System 0/2

SIMULATION

Details Metrics Settings

VISIBILITY

3D View

Particles Animation

Particles Color by Speed

Grid Visible

Solid Mesh Visible

Coordinate Axes

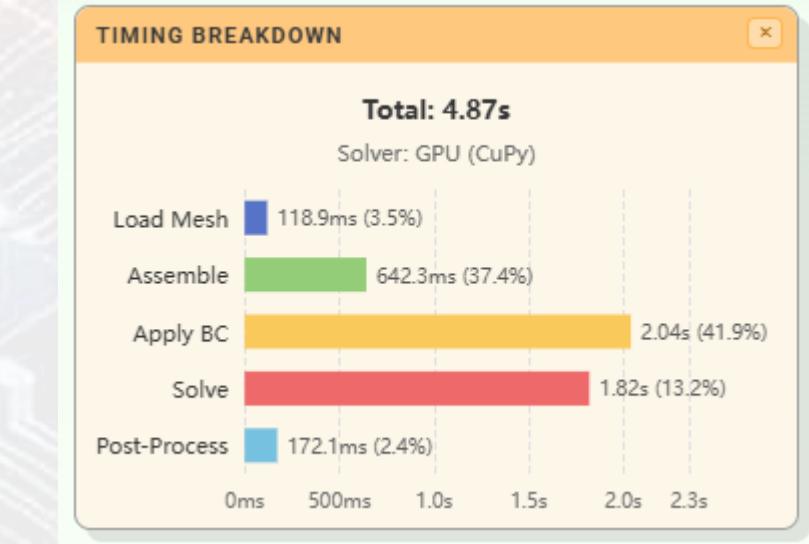
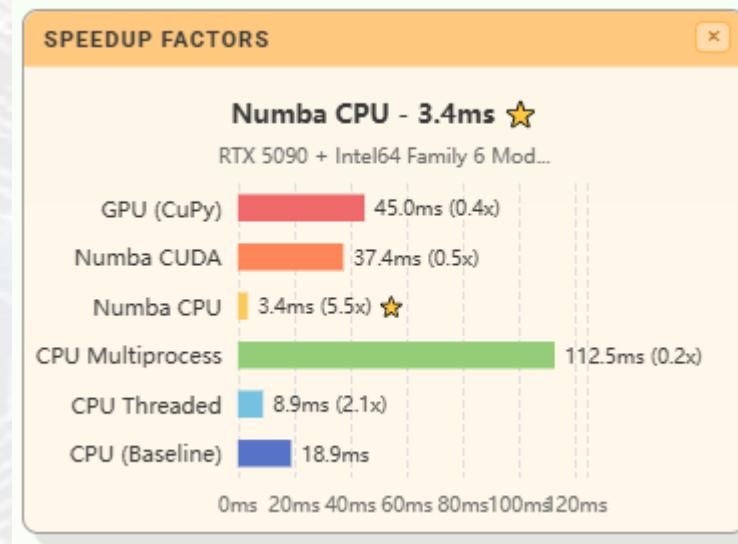
APPEARANCE

Mesh Opacity 100%

Particle Count 1,000

Speed Scale 0.3x

2 – Simulation Metrics - Examples



3 – Benchmark & Simulations History

BENCHMARK

SOLVERS MESHES SERVERS TESTING REPORTS

All Solvers All Meshes All Servers All Mesh Performance View

Model	Solver	Nodes	Elements	Total Time	Assembly	Solve	Iterations	Peak RAM	Peak VRAM	Status	Date ▾
<input type="checkbox"/> ► FEMULATOR	i9-13900K	94.3 GB RAM	RTX 4090	24 GB VRAM							1 record
► DESKTOP-B968RT3 (Automated)	AMD64 Family 25 Mode...	- RAM	RTX 5060 Ti	15.9 GB VRAM							432 records
► RICKYROG700 (Automated)	Intel64 Family 6 Mod...	- RAM	RTX 5090	31.8 GB VRAM							432 records
► KRATOS (Automated)	Intel64 Family 6 Mod...	- RAM	RTX 4070	12 GB VRAM							432 records
► MERCURY (Automated)	i9-13900K	94.3 GB RAM	RTX 4090	24 GB VRAM							432 records

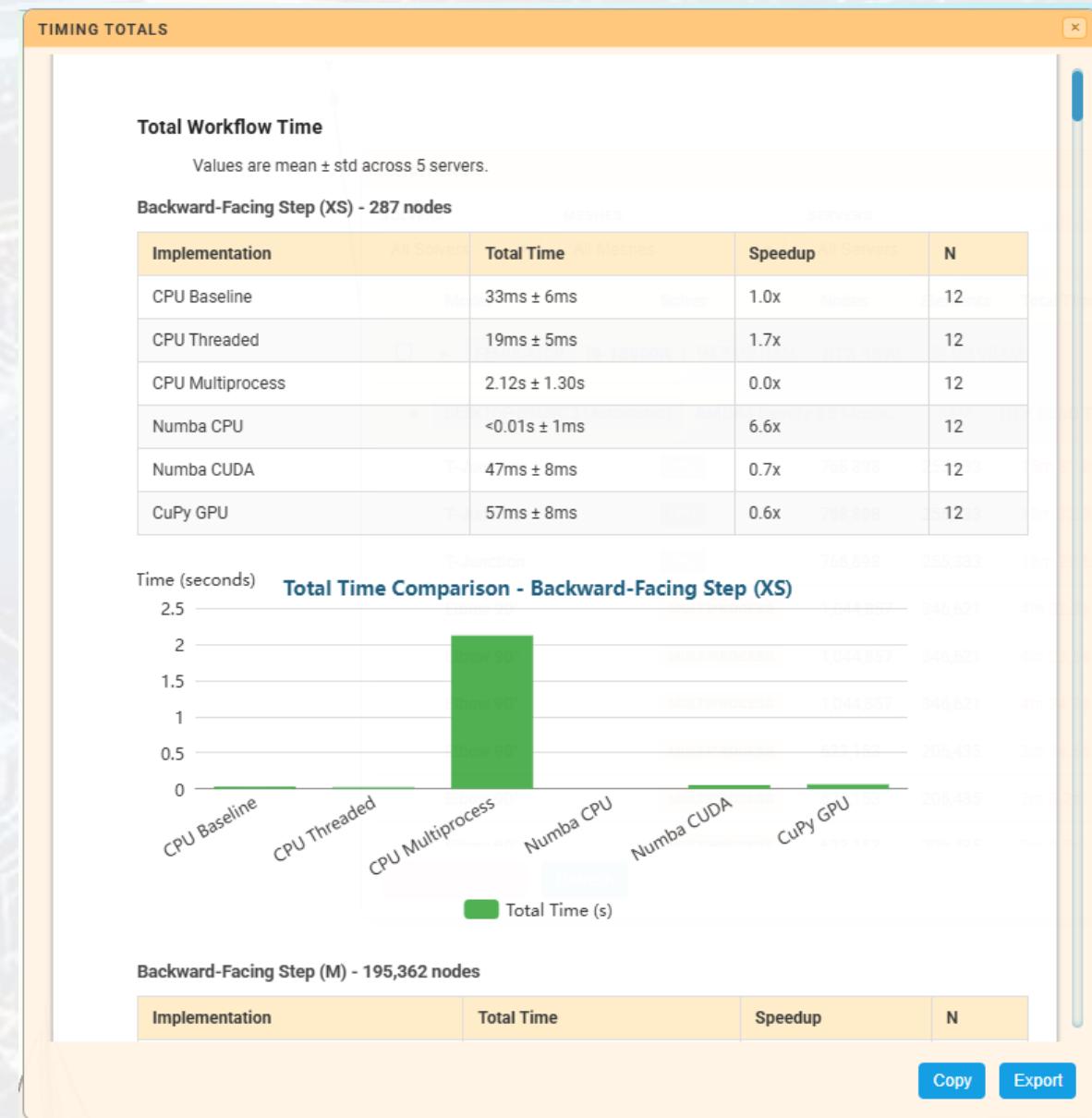
Delete Selected Refresh Copy Export Close

3 – Benchmark & Simulations History - Reports

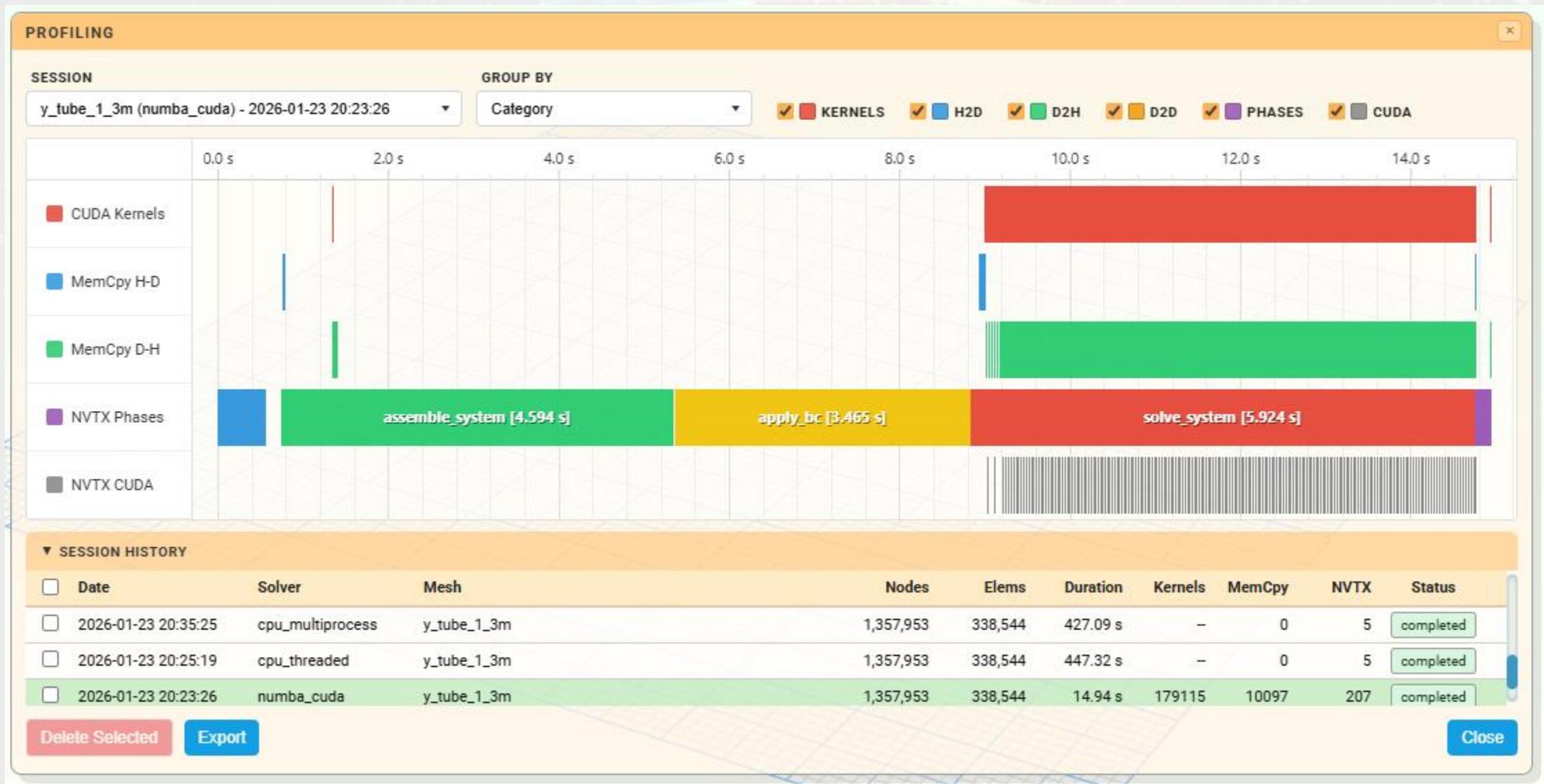
REPORTS

- Stage Breakdown
- Mesh Performance
- Testing Environment
- Timing Totals**
- Stage Breakdown
- Scaling Analysis
- Convergence Verification
- Efficiency Metrics
- Testing Reproducibility
- Critical Analysis
- Conclusions

✓ Jan 19, 11:22 PM



4 – Profiling Sessions



5 – Reporting

REPORTING

- Tutorial #3 - Final Report
 - High-Performance GPU-Accelerated Finite Eleme...
 - 1. Introduction - Finite Element Method
 - 2. Software Architecture
 - 3. Implementations
 - 4. Performance Evaluation
 - 5. Progressive Profiling Optimization
 - 7. Conclusions
 - 8. Annexes
- Annex A - Solver Implementations Detailed Report
- Annex B - FEMulator Pro Installation
- Annex C - Project Proposal (Tutorial #1)

The image shows a digital representation of a project report cover. The cover features a central blue and orange glowing circular logo with the text 'CGAD' in the center. The background is dark with a futuristic, glowing circuit board pattern. At the top left is the 'iscte INSTITUTO UNIVERSITARIO DE LISBOA' logo. At the bottom right, the text 'PROJECT REPORT' is above 'HIGH-PERFORMANCE GPU-ACCELERATED FINITE ELEMENT ANALYSIS' in bold red letters. Below this, a list of names is visible: 'Antonio Cruz (140129), Bruno Santos (140586), Pedro Miranda (129268), Ricardo Kayseller (95613)'. There are 'Edit' and 'X' buttons at the bottom right of the cover image.

6 - About

