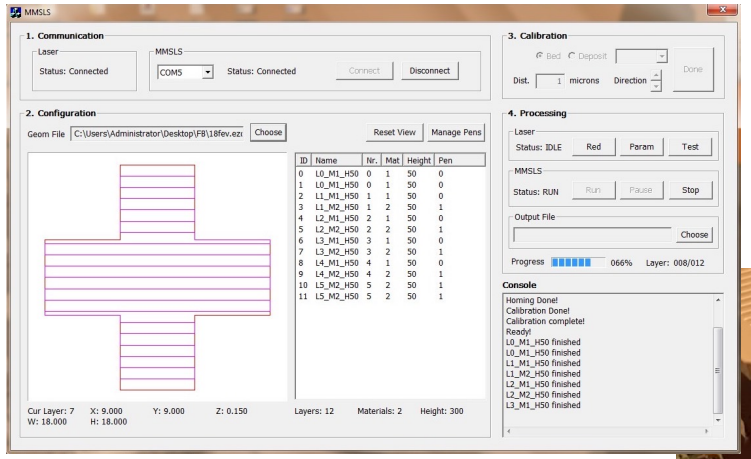
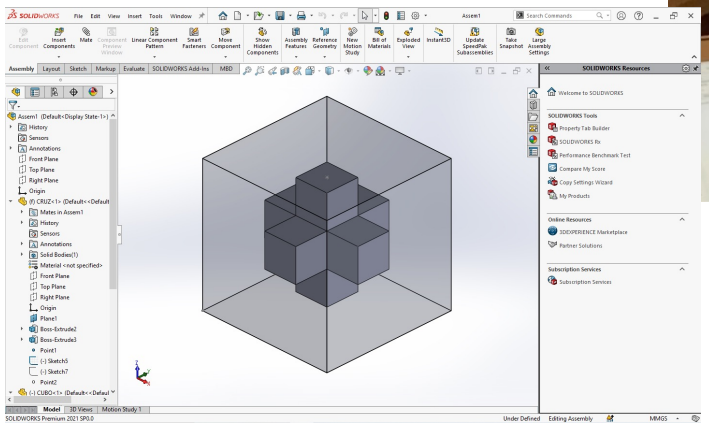


(3) Post-Processing & Manufacturing

the model is mapped to process params. and printed

(2) Slicing & Path generation

each model is processed and merged into a model

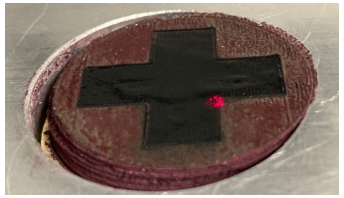


(1) 3D modelling

each model corresponds to a material

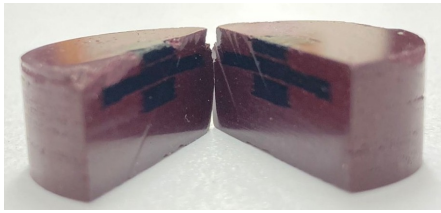
(3.1) Manufacturing

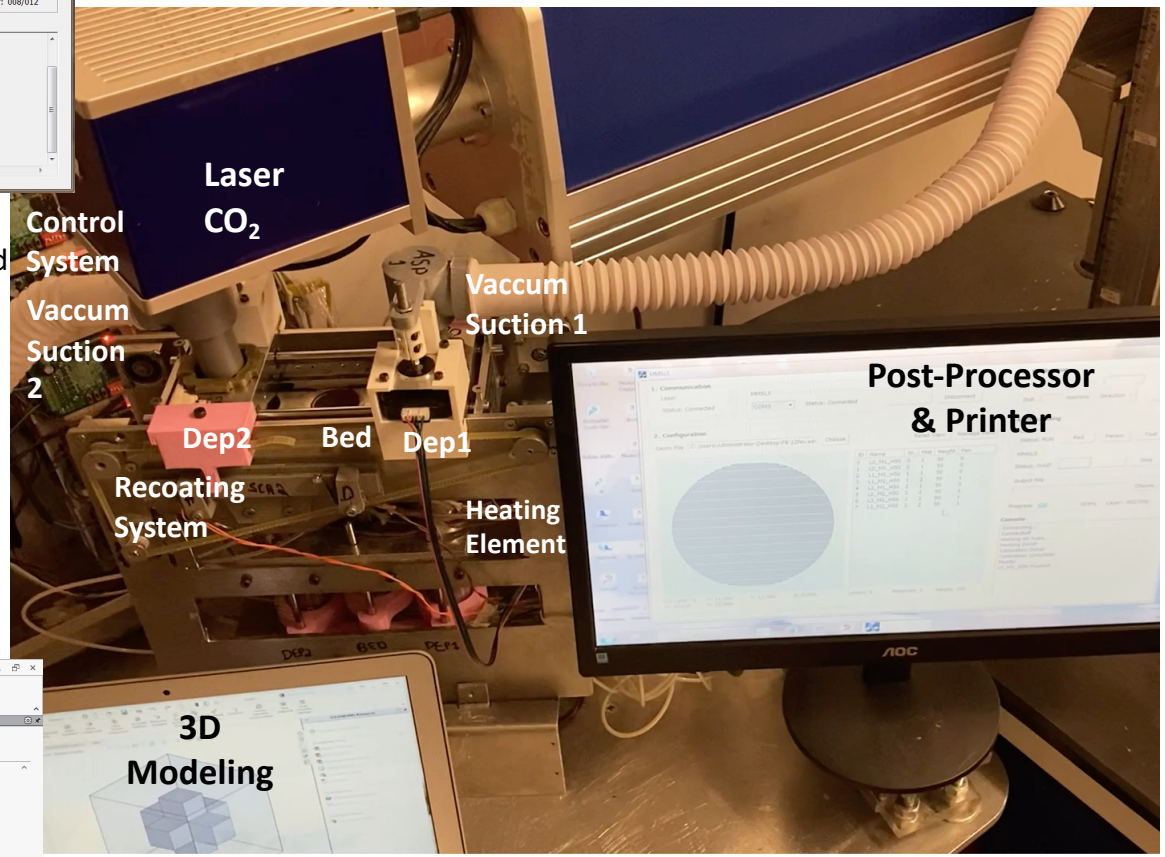
- Scan paths are printed with the process params. for each layer
- Each layer can have multiple materials
- Each material is removed before a new one is added



(3.2) Part produced

- Material variation in both horizontal and vertical directions
- Conformity to 3D CAD model
- Design and fabrication of multi-material parts simplified



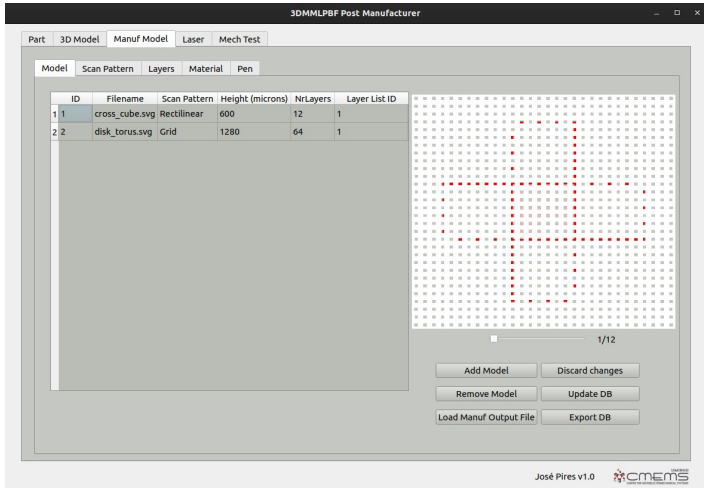


Custom Low Budget 3D Multi-Material L-PBF equipment & Toolchain

- **Bi-material**
- **Build volume (mm^3)**: 25⌀ x 100
- **Laser**: CO2 (but successfully tested with multiple laser sources (YAG-Nd, Fiber))
- **Estimated cost**: 8700€ = 7500 (Laser) + 1200 (equip.)

(4) Post-manufacturing

- Manufacturing info is added to databases
- Info can be feedback to all key agents in the manufacturing chain
- Process analysis and improvement, manufacturing quality improvement, design of experiments , etc.



A global methodology for 3D multi-material L-PBF processes

Problem: Design and fabrication of multi-material metallics and composites parts is hard and expensive
Process knowledge is not available for the designer
Proposed solution: A global methodology to leverage the information in the manufacturing chain, easing and improving design and manufacturing
Outputs: workflow, toolchain and low-cost equipment
Features: Material variation in both horizontal and vertical directions; ease of use; info feedback