



DRD1 - First WG4 working meeting

GEM simulations

Evaluate alternative geometries and support aging studies

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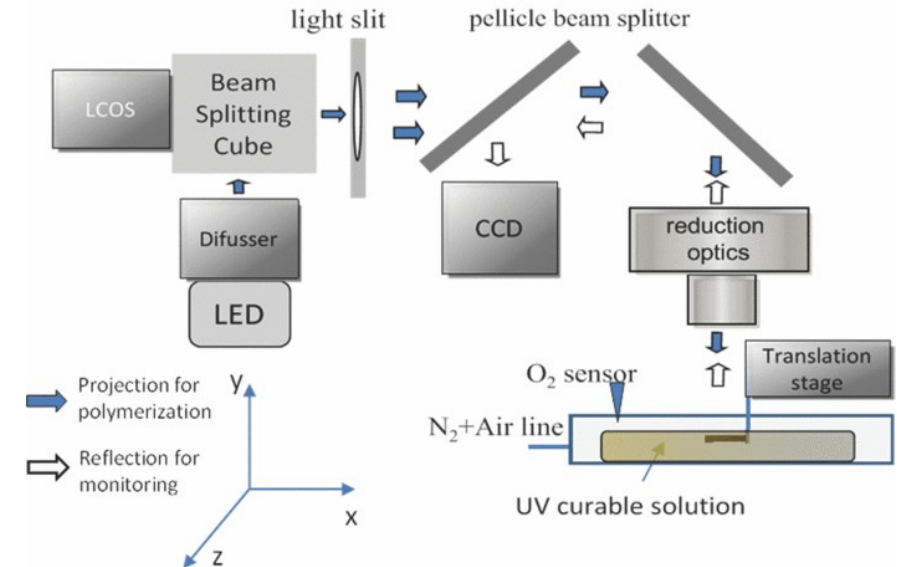
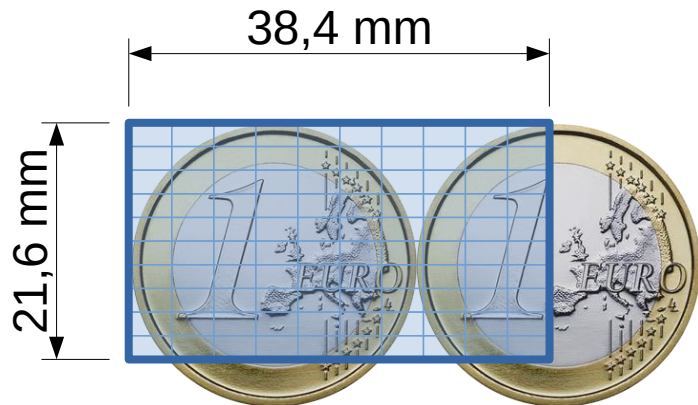


High Energy Physics and Instrumentation Center at USP

Micrometer resolution 3D printing

Enabling flexibility and speed to prototyping

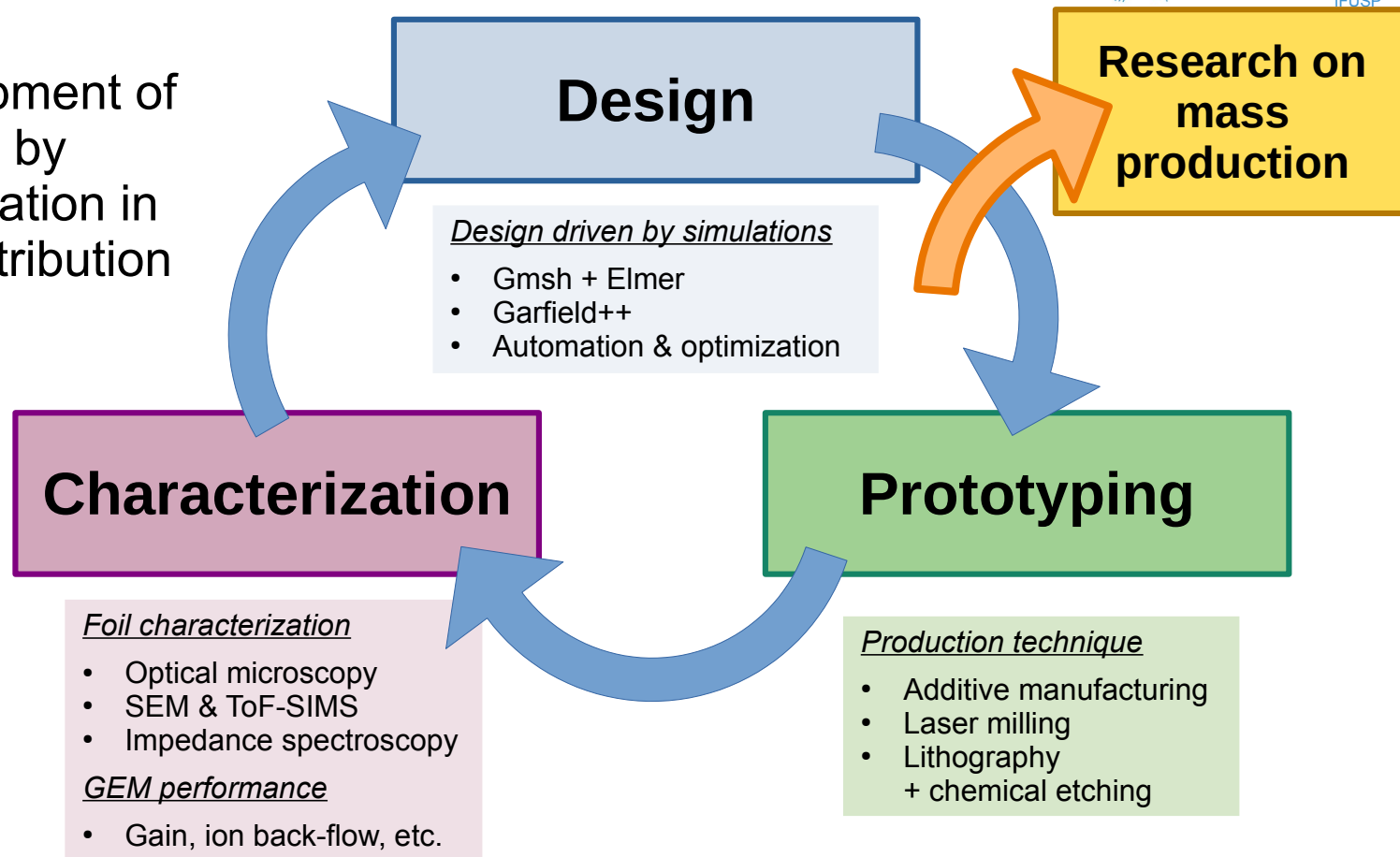
- Projection micro stereolithography (collaboration with BMF3D):
 - Printing voxel resolution: 2-3 μm
 - Single exposure size: 3.84 mm (X) * 2.16 mm (Y) * 10 mm (Z)
 - Maximum product size: 38.4mm (X) * 21.6mm (Y) * 10 mm (Z)



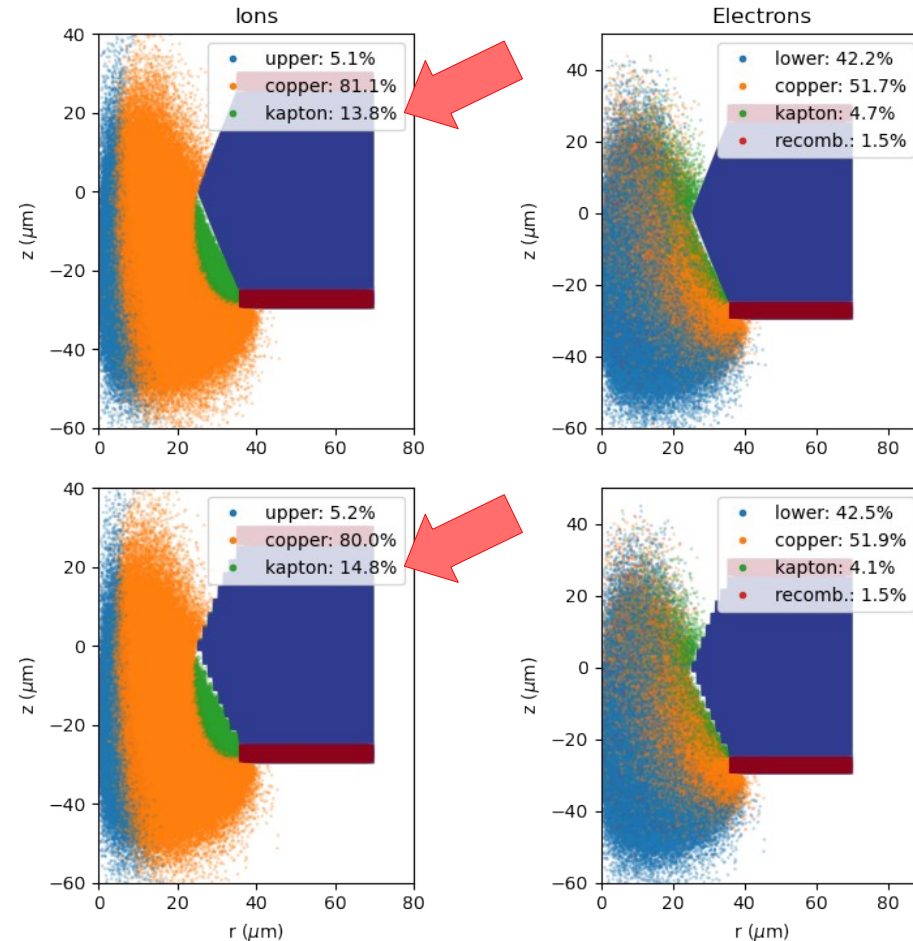
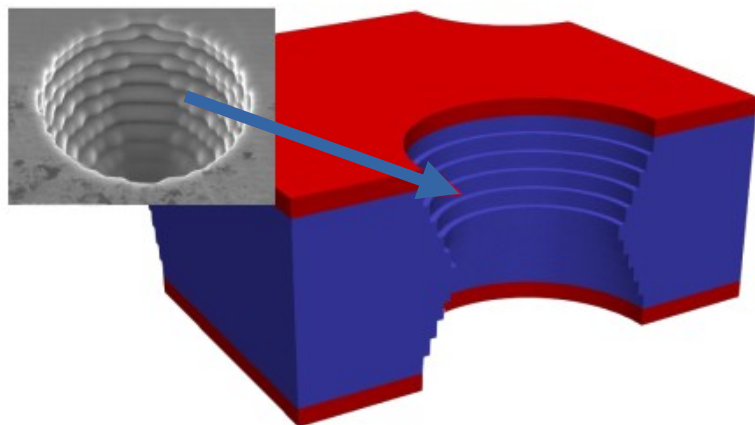
Zheng, X., Deotte, J., Alonso, M.P., Farquar, G.R., Weisgraber, T.H., Gemberling, S., Lee, H., Fang, N. and Spadaccini, C.M., 2012. Design and optimization of a light-emitting diode projection micro-stereolithography three-dimensional manufacturing system. *Review of Scientific Instruments*, 83(12), p.125001. [link]

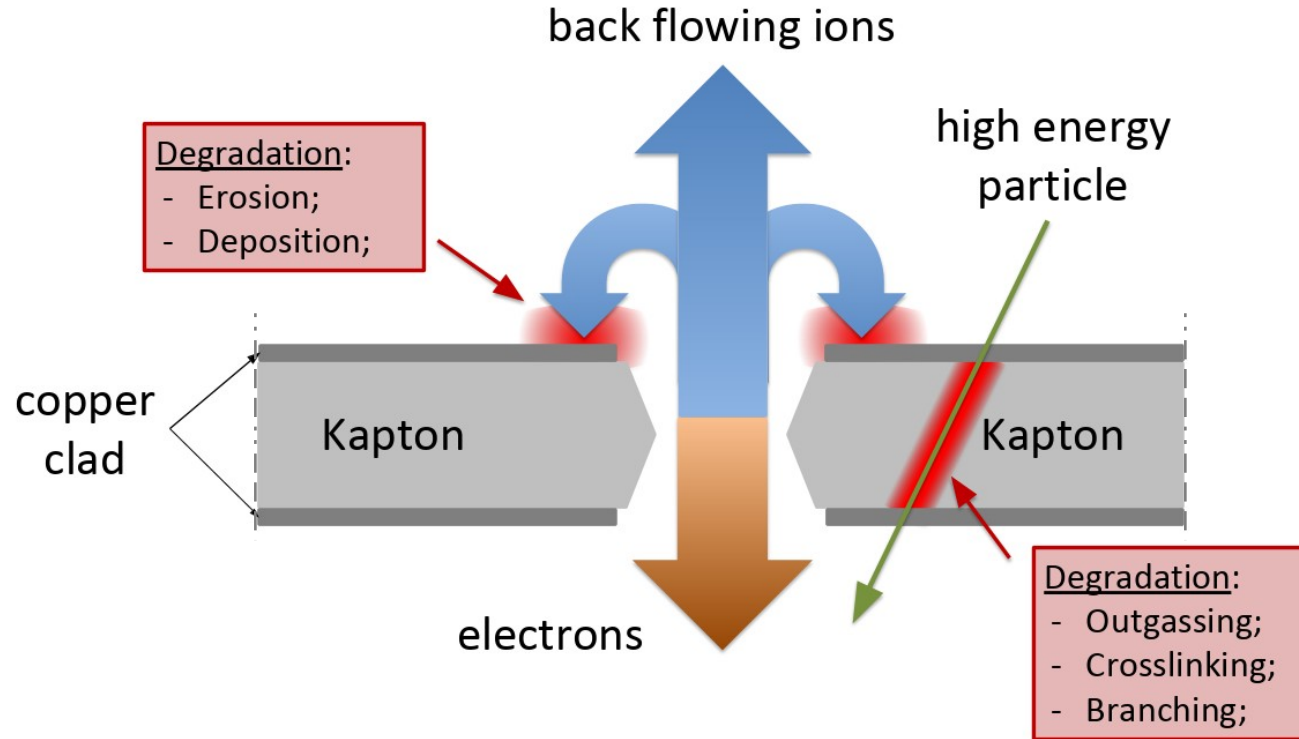
- We aim the development of GEM functionalities by micro-sized optimization in the electric field distribution

- Whatever the outcome from this research requires additional steps for mass/large production



- What is the impact of the printing artifacts?
 - Simulation of roughness

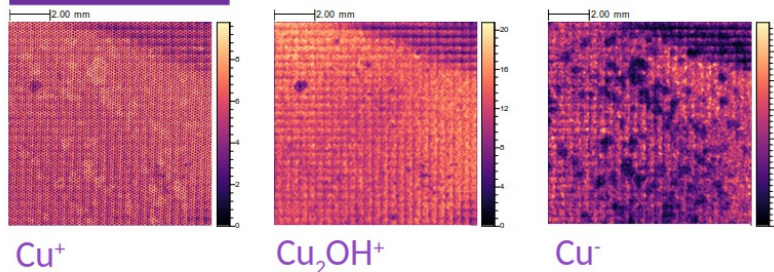




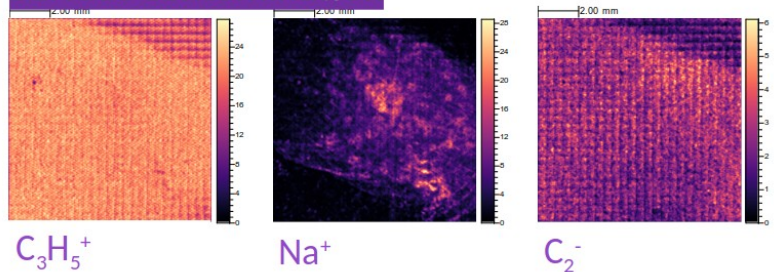
"Preliminary studies on GEM foil degradation in harsh radiation environments", PoS, 2019, <https://doi.org/10.22323/1.350.0036>

Simulation as a tool to understand the results

Cu oxide / Cu



Surface contamination



Organic pattern adsorbed onto surface

