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Laser Polishing of Additively Manufactured RFQ Prototype

Additive manufacturing and laser powder bed fusion in particular are offering significant benefits in designing and manufacturing parts with complex geometry that can be used for accelerator component manufacturing. But one of main drawbacks of this technology is the surface roughness of finished product.

The main goal of this project was to explore possibilities to reduce surface roughness and porosity of radio frequency quadrupole (one of main components in a linear particle accelerator) built with additive manufacturing of pure copper by laser polishing. It was done in 2 steps: publications of aluminium laser polishing were studied and then recommended laser parameters for initial experiment of copper laser polishing were derived.

Primary author: LACIS, Viesturs (Riga Technical University (LV))

Co-author: RATKUS, Andris (Riga Technical University (LV))

Presenter: LACIS, Viesturs (Riga Technical University (LV))