



Contribution ID: 1527 Contribution code: THPM023

Type: **Poster Presentation**

## **Additive Manufacturing of 6 GHz seamless SRF copper cavities: printing, surface treatments and performance investigations**

*Thursday, 11 May 2023 16:30 (2 hours)*

Traditionally produced SRF cavities are characterized by many limiting drawbacks, such as welding lines and poor reproducibility of their properties. Additive Manufacturing, and in particular Laser Powder Bed Fusion (LPBF), may overcome these issues: with this technology, it is possible to create seamless components with reproducible characteristics. But 6 GHz cavities cannot see internal supports because they would not be easily removable. On the other hand, the down-skin self-supporting surfaces are extremely rough and unsuitable for the intended application. Indeed, very smooth surfaces are required since copper cavities are internally coated with superconducting materials (like Nb or Nb alloys): several surface treatments have been performed and studied; tests like tightness, resonant frequency and internal inspections have also been carried out before and after the post-printing smoothing and coating stages. Results are very promising and they will be shown in this work.

### **Funding Agency**

### **Footnotes**

### **I have read and accept the Privacy Policy Statement**

Yes

**Primary author:** CANDELA, Valentina (INFN- Sez. di Padova)

**Co-authors:** BONESSO, Massimiliano (INFN- Sez. di Padova); CANDELA, Silvia (INFN- Sez. di Padova); CHYHYRYNETS, Eduard (Università degli Studi di Padova); DIMA, Razvan (INFN- Sez. di Padova); FAVERO, Giacomo (INFN- Sez. di Padova); FORD, Davide (Istituto Nazionale di Fisica Nucleare); PIRA, Cristian (Istituto Nazionale di Fisica Nucleare); POZZI, Mateo (Rosler Italian); REBESAN, Pietro (INFN- Sez. di Padova); PEPATO, Adriano (Univ. degli Studi di Padova)

**Presenter:** CANDELA, Valentina (INFN- Sez. di Padova)

**Session Classification:** Thursday Poster Session

**Track Classification:** MC7: Accelerator Technology and Sustainability: MC7.T35: Advanced Manufacturing Technologies for Accelerator Components