



Contribution ID: 181

Type: **Contributed Poster**

## **HIGH GRADIENT TESTING RESULTS OF THE C-BAND BENCHMARK $a/\lambda=0.105$ CAVITIES AT LANL**

*Tuesday, 8 November 2022 17:00 (2h 30m)*

This presentation will report results of high gradient testing of two C-band accelerating cavities fabricated at Los Alamos National Laboratory (LANL). LANL has successfully commissioned a C-band Engineering Research Facility of New Mexico (CERF-NM) which now serves for testing accelerating cavities at C-band. The test stand is powered by a 50 MW, 5.712 GHz Canon klystron and offers a unique capability of conditioning and testing accelerating cavities for operation at surface electric fields at the excess of 300MV/m,. Recently, we fabricated and tested two benchmark copper cavities at CERF-NM. The goal of the test was to establish a benchmark for high gradient performance at C-band. The cavities were a direct scale of the similar test structures fabricated and tested by other institutions at the frequencies of X-band and S-band. The geometry of the cavities consisted of three cells with one high gradient central cell and two coupling cells on the sides. The ratio of the radius of the coupling iris to the wavelength was  $a/\lambda=0.105$ . The two tested cavities were made of pure soft alloy copper, and these benchmark results can be later compared to other tests of cavities fabricated with different alloys and different fabrication methods. Both cavities were conditioned up to the peak surface field of approximately 250MV/m. At the end of conditioning both cavities could operate at this field level with no measurable breakdowns over several hours of operation.

### **Acknowledgments**

**Primary authors:** ZUBORAJ, Muhammed (Los Alamos National Laboratory); HALL, Wesley (LANL); GORELOV, Dmitry (LANL); MIDDENDORF, Mark (LANL); RAI, Deepak (LANL); SIMAKOV, Evgenya (LANL); TAJIMA, Tsuyoshi (LANL)

**Presenter:** ZUBORAJ, Muhammed (Los Alamos National Laboratory)

**Session Classification:** Poster Session and Reception

**Track Classification:** Poster Session: WG3 Poster: Laser and High-Gradient Structure-Based Acceleration