Introduction

The HL-LHC Accelerator Upgrade Project (HL-LHC AUP), focuses on production of quadrupoles and cavities by sharing the work among a consortium of US Laboratories (FNAL, ANL, LBNL, BNL, JLAB and SLAC) and Old Dominion University, and in close connection with the CERN-led HL-LHC Collaboration.

Crab cavities are one of the key technologies enabling the High Luminosity upgrade of LHC by rotating bunches at the interaction point and recovering luminosity lost due to the non-zero crossing angle.

Fabrication

AUP has launched fabrication of cavities in industry with a plan to produce 2 prototypes, 2 pre-series, and 10 series cavities. Ultimately, 8 cavities will be installed in the HL-LHC tunnel. A rigorous quality assurance plan is in place to ensure compliance with stringent CERN requirements.

Chemical Processing and Qualification

A dedicated rotational chemical processing tool was developed at ANL and validated thanks to LARP prototypes, later inherited by AUP. Fermilab facilities were utilized for the heat treatments and cold tests of the RFD cavities.

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