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SWELL 1.3 GHz Cavity fabrication approach and machining

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The Slotted Waveguide Elliptical (SWELL) cavity is an elliptical accelerating cavity with an innovative design, proposed by CERN and developed in the scope of the FCC-ee study. The SWELL design is composed of four quadrants, separated by radial slots in order to improve higher order modes (HOM) transverse damping, while minimizing impact on the longitudinal accelerating mode. The quadrants for the SWELL cavity prototype were manufactured in CERN main mechanical workshop from the bulk Oxygen-Free Electronic (OFE) copper rods. Specific fabrication strategy and R&D have been implemented, to optimise fabrication yield with respect to RF performance. The fabrication approach was created based on the experience gained with Radio Frequency Quadrupole (RFQ) production. The introduced process relay on thermal treatment cycle and close synergy between high precision milling operations and metrological CMM measurements. In parallel with this fabrication, CERN lunches studies for optimization of machining parameters with regard to radio frequency performance.

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Footnotes

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Yes

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