

First Results of SRF Cavity Fabrication by Electro-Hydraulic Forming at CERN

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Superconducting RF (SRF) structures are traditionally fabricated from sheet metal forming. An alternative technique to traditional shaping methods, such as deep-drawing and spinning, is Electro-Hydraulic Forming (EHF). In EHF, cavities are obtained through ultra-high-speed deformation of blank sheets, using shock-waves induced in water by a pulsed electrical discharge. With respect to traditional methods, such highly dynamic process can yield interesting results in terms of effectiveness, repeatability, final shape precision, higher formability and reduced spring-back. In this paper, the first results of EHF on copper prototypes and ongoing developments for niobium are presented and discussed. The simulations performed in order to master the embedded multi-physics phenomena and to steer process parameters are also presented.

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