



# *Surface Polishing of Niobium for Superconducting Radio Frequency (SRF) Cavity Applications*

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## Abstract

Niobium cavities are important components in modern particle accelerators based on superconducting radio frequency (SRF) technology. The interior of SRF cavities are cleaned and polished in order to produce high accelerating field and low power dissipation on the cavity wall. Current polishing methods, buffered chemical polishing (BCP) and electro-polishing (EP), have their advantages and limitations. Laser is proposed as a promising "green" alternative polishing tool to traditional methods, because no chemistry is needed during laser polishing. This dissertation starts with insights into the interests and issues in the traditional polishing processes. And then we show that smoothing effect was achieved with laser polishing by carefully choosing experimental parameters.