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Effect of chemical and heat treatment on the superconducting properties of niobium used in superconducting radiofrequency cavity fabrication PASHUPATI DHAKAL, GIANLUIGI CIOVATI, GANAPATI RAO MYNENI, Jefferson Lab, Newport News VA — Niobium is the material of choice for the fabrication of the superconducting radiofrequency (SRF) cavities used in particle accelerator. In the last four decades, much work has been done to push the performance of SRF cavity to its theoretical limits of the accelerating gradient and high quality factor. One of the issues towards achieving those limits is the high residual loss and occurrence of a sharp increase of the RF losses (decrease in quality factor) when the peak magnetic field reaches about 100 mT, consequently limiting the operational accelerating gradient of SRF cavities. We present the result on the effect of the surface and heat treatment on ac and dc superconducting properties to explore the limiting factors of the SRF cavity performance.

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