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Recent SRF R&D results at Fermilab

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Superconducting accelerating cavities are the technology of choice for many modern and future particle accelerators. Increasing their efficiency is therefore crucial to minimize the power consumption during their operation and therefore significantly cut the cost and enabling the realization of more powerful machines. The efficiency of niobium superconducting RF cavities can be maximized in the medium field range by introducing a small amount of nitrogen, with the so-called N-doping and N-infusion treatments. Recent results obtained with these treatments will be discussed, underlying their potential for different kind of machines. The talk will also show how performance of niobium cavities processed with state-of-the-art surface treatments varies as a function of the resonance frequencies, between 650 MHz and 3.9 GHz. Recent progress in Nb₃Sn coating will be also discussed.

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