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High pressure rinse simulations for PIP-II SRF cavities

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The implementation of High Pressure Rinse (HPR) not only ensures thorough cleaning of the inner high purity niobium surface of Superconducting Radio Frequency (SRF) cavities but also unlocks their full potential for achieving peak performance. By effectively removing contaminants and impurities, HPR sets the stage for enhanced superconducting properties, improved energy efficiency, and superior operational stability. A simulation tool has been developed, facilitating the accurate prediction of both the quality and effectiveness of the rinsing process before its execution in the cleanroom. This tool, the focus of this paper, stands as a pivotal advancement in optimizing Superconducting Radio Frequency (SRF) cavity preparation. Furthermore, our paper will also present correlations with cavity cold testing results, demonstrating the practical applicability and reliability of the simulation predictions in real-world scenarios.

Footnotes

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