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V3Si: an alternative thin film material for superconducting RF cavities

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Superconducting materials, like V3Si, NbN, NbTiN and Nb3Sn, are potential alternatives to Nb for next generation thin film SRF cavities. In comparison to the Nb, their relatively high T_c could allow for operation at higher temperatures (≥ 4 K) and the higher critical field could lead to for higher accelerating gradients. We investigate optimum deposition parameters and substrates for V3Si, using single target physical vapor deposition (PVD). We report on the superconducting properties such as T_c and surface resistance using RRR and low power RF, stoichiometry using RBS, SIMS, XPS and EDX and surface quality using AFM and white light interferometry.

Footnotes

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