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Development of Nb₃Sn SRF cavity using electroplating method

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Nb₃Sn is a material with about twice the superheating field and superconducting transition temperature of Nb. By forming an Nb₃Sn film on the inner surface of an Nb cavity, the cavity length can be shortened and the system can be operated with a small refrigerator, thus realizing a compact superconducting accelerator system with low operating cost and low price. At KEK, the electroplating method is being investigated as an alternative to the conventional method for forming Nb₃Sn films. Based on this research, we have been studying the formation of Nb₃Sn films in 3GHz single-cell cavities as our ultimate goal. In this presentation, we will report on the Nb₃Sn film formation process and the evaluation results of the fabricated samples.

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