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CONSTRUCTION OF Nb₃Sn COATING SYSTEM AND TRIAL OF SAMPLE COATING AT KEK

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A tin vapor diffusion system was constructed for Nb₃Sn cavity R&D at KEK. The vapor diffusion system consists of a vertical vacuum furnace, a coating chamber made of niobium, and a heating device for tin evaporation. In the thermal design of the coating system, the temperature distribution of cooling and coating part was investigated using ANSYS. After construction of the vapor diffusion system, we carried out the commissioning of the furnace. We have performed Nb₃Sn coating tests on niobium samples with various coating time and temperature for each sample. Sample surface, cross section, and tin composition ratio are observed. The critical temperature of the samples is measured by Quantum Design MPMS. Some samples measured have a critical temperature around 18 K and tin composition ratio around 25 at%. In this presentation, design and construction of the coating system and sample coating results are reported.

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