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Development of Nb₃Sn cavity by vapor diffusion method at IMP

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The progress in the development of Nb₃Sn cavity coating by vapour diffusion method at IMP was reported. Several 1.3GHz single cell cavities were coated and vertically tested. Up to now, the unloaded Q value of IMP Nb₃Sn cavity at 4.2K reached 7.6e9 at the low field region, which is about three times lower than the Cornell results. Meanwhile, the quench field was only E_{acc}=8MV/m. Although the superconductivity of the IMP Nb₃Sn sample determined from the M-T measurement by DC magnetic field starts at 18.05K (when the magnetic moments of the sample began to decrease rapidly), it finishes at about 17.30K (when the magnetic moments of the sample began to stabilize at a minimum value). The transition width is as large as about $\Delta T_c=0.75K$, which is much larger than $\Delta T_c=0.12K$ of the Cornell sample. The upgradation of the deposition system attempted to minimize the carbon contamination has been completed and the progress of the new coating work is discussed.

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