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Towards a Cryogen-Free MgB_2-Based Superconducting Radio Frequency Accelerating Cavities[1] ALIREZA NASSIRI, ANL — Studies on the application of Magnesium diboride (MgB_2) superconducting films have shown promise for use with the radio-frequency (SRF) accelerating cavities. MgB_2 coating is a potential candidate to replace bulk niobium (Nb) SRF cavities. The ultimate goal of our research is to demonstrate MgB_2 coating on copper cavities to allow operation at about 20 K or so as a result of the high transition temperature (T_c) of MgB_2 and taking advantage of the excellent thermal conductivity of copper. Here, we will report on our recent experimental results of applying hybrid physical-chemical vapor deposition (HPCVD) to grow MgB_2 films on 2-inch diameter copper discs as well as on a 2.8 GHz resonator cavity

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