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Progress towards a Hybrid Superconducting Microwave Cavity for ADMX[1] GIANPAOLO CAROSI, Lawrence Livermore National Laboratory, ADMX COLLABORATION, ADMX-HF COLLABORATION — Dark-matter axions can be detected by their resonant conversion into photons using microwave resonant cavities in an axial magnetic field. This is the basis of both the ADMX and ADMX-HF experiments currently under construction. The axion-photon conversion power is directly related to the quality factor (Q) of the microwave cavity used. To date copper cavities have been used with $Q \sim 10^5$ at frequencies of 1 GHz. However, superconducting cavities can regularly be made with $Q > 10^9$. Here we describe progress of R&D efforts to make hybrid cavities with a superconducting barrel and normal copper end-caps that can maintain their superconducting properties and an enhanced Q in a magnetic field.

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