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Limits on cold dark matter axions from the ADMX high resolution search GRAY RYBKA, University of Washington, STEVEN ASZTALOS, Lawrence Livermore National Laboratory, RICHARD BRADLEY, National Radio Astronomical Observatory, GIANPAOLO CAROSI, Lawrence Livermore National Laboratory, MICHAEL HOTZ, University of Washington, JUNGSEEK HWANG, University of Florida, DARIN KINION, Lawrence Livermore National Laboratory, LESLIE ROSENBERG, University of Washington, PIERRE SIKIVIE, DAVID TANNER, University of Florida, KARL VAN BIBBER, Lawrence Livermore National Laboratory — The axion, a hypothetical particle invented to solve the strong CP problem in the Standard Model, has properties that also make it a compelling dark matter candidate. The Axion Dark Matter experiment (ADMX) looks for the conversion of nearby halo axions into nearly monochromatic microwave photons. Some theories of axion production of the early universe predict that present day axions will have velocity dispersions much smaller than they would had they been produced in thermal equilibrium. The high resolution channel in ADMX takes advantage of these low velocity dispersions to probe even pessimistic axion-to-photon couplings for these “cold axion” models. Additionally, the high resolution channel is sensitive to seasonal and annual changes in a cold axion signal, offering an insight into galactic dark matter distribution. This talk will cover the search for cold dark matter axions with masses of a few MeV using the ADMX high-resolution channel.

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