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# CAST results and Axion Review

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Axions have been invented to accommodate the vanishingly small CP Violation in the strong interactions, probed mainly by the stringent limits on the neutron electric dipole moment. Additionally, their discovery may offer a solution to the so much wanted Cold Dark Matter constituent. CAST, the CERN Axion Solar Telescope, searched for axions with masses up to ~0.02eV and improved the axion to photon coupling beyond the ones derived from astrophysical arguments for the first time, g(aγ)<8.8x10^-11GeV^-1. CAST has recently extended its research potential to higher masses, by introducing in the magnet bore a buffer gas, initially 4He (completed) and currently 3He, and has published the best experimental limit in almost the full mass range up to 0.39eV. The CAST experiment has scanned already masses up to 0.64eV and will continue to reach beyond the HDM axion mass limit of ~1eV. The plans are to extend its searches to the sub-keV range. CAST was the first helioscope to operate in the visible. New generation, extra low noise Micromegas detectors of the microbulk technology offer the opportunity to reach a level of g(aγ)~ (few)x10^-11 GeV^-1. ADMX, the Axion Dark Matter eXperiment, on the other side is searching for relic galactic halo axions and is in the reach of the theoretically (KSVZ and DFSZ) favored "axion line"at the μeV mass scale. The results obtained up to now with a GaAs HFET amplifier are going to be superseded with the use of a SQUID amplifier, the world's quitest spectral receiver, which boosts the sensitivity down to the detection of one rf photon (axion) per minute. ADMX targets at a definitive axion search in the phase space bounded by the astrophysical constraints and the universe overclosure reasoning.

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