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First searches for axion and dark photon dark matter with MADMAX prototypes

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The QCD axion is a well-motivated hypothetical particle that simultaneously addresses the strong CP problem and constitutes a compelling cold dark matter candidate. The MADMAX experiment (Magnetized Disk and Mirror Axion Experiment) is designed to search for dark matter axions and similar particles (axion-like particles and dark photons) in the mass range of $40\text{--}400\,\mu\text{eV}$ by boosting the microwave radiation in the range of $10\text{--}100\text{ GHz}$ induced by the inverse Primakoff effect in a dielectric haloscope. Several small scale prototype systems have been tested these last three years, allowing to validate the dielectric haloscope concept and obtain competitive results of axion and dark photon dark matter searches. This talk will present an overview of the MADMAX experiment, summarize the recent results, the ongoing research and development and the remaining challenges.

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