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BRASS: Broadband Radiometric Axion SearcheS

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We present here a modification of the spherical reflector approach
proposed for broadband searches for axion dark matter. The new concept
foresees the use of a permanently magnetized surface ({\em magnetized
converter}) employed for axion/ALP−photon conversion. The magnetized
converter comprises a two-dimensional Halbach array providing a
sufficiently homogeneous magnetic field with a $B_{||} \sim 1$ T component parallel to the
surface and concentrated within about 1 cm height above it. This enables
effective conversion of dark matter axions and ALPs with masses above $\approx 80\,\mu$eV (20 GHz). Based on this
modification, a conceptual design
for broadband radiometric axion searches (BRASS) has been developed,
aiming at providing an experimental facility for WISP dark matter
searches in the 20 GHz−1 THz (0.08−4 meV) range. Details of the
experiment design, expected sensitivities to WISP dark matter, and present plans
for constructing the first prototype setup will be discussed.

Summary

A conceptual design for broadband radiometric axion searches (BRASS) employing a permanently magnetized surface for stimulating the axion−photon conversion in a 0.08−4 meV mass range will be introduced and plans for construction of the first prototype will be discussed.

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