

References for AxionLimits webpage

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1 Axion-photon

Haloscopes

- ABRACADABRA [1, 2]
- ADMX [3, 4, 5, 6]
- ADMX-Sidecar [7, 8]
- ADMX-SLIC [9]
- CAPP [10, 11, 12, 13]
- BASE [14]
- GrAHal [15]
- HAYSTAC [16, 17]
- ORGAN [18, 19]
- QUAX [20, 21]
- RADES [22]
- RBF [23]
- SHAFT [24]
- TASEH [25]
- SuperMAG [26]
- UF [27]
- UPLOAD-DOWNLOAD [28]
- ABRACADABRA (projection) [29]
- ADBC (projection) [30]
- ADMX (projection) [31]
- aLIGO (projection) [32]
- ALPHA (projection) [33]
- BRASS (projection) [34]
- BREAD (projection) [35]
- CADEx (projection) [36]
- DM-Radio (projection) [37, 38]
- DANCE (projection) [39]
- LAMPOST (projection) [40]
- MADMAX (projection) [41]
- FLASH (projection) [42, 43]
- QUAX (projection) [44]
- ORGAN (projection) [18]
- TOORAD (projection) [45]
- WISPLC (projection) [46]
- SRF heterodyne cavity (projection) [47]

LSW/Helioscopes

- ALPS [48]
- CAST [49, 50]
- CROWS [51]
- OSQAR [52]
- PVLAS [53]
- SAPPHIRES [54]
- ALPS-II (projection) [55]
- IAXO (projection) [56]
- IAXO (Galactic SN) [57]

Astro

- Betelgeuse [58]
- Breakthrough Listen (Doppler shifted radio line in MW) [59]
- Breakthrough Listen (Neutron stars) [60]
- Bullet Cluster (archival radio data) [61]
- Chandra (Hydra) [62]
- Chandra (M87) [63]
- Chandra (NG7 1275) [64]
- Chandra (H1821+643) [65]
- Chandra (Magnetic white dwarfs) [65]
- COBE/FIRAS+Planck spectral dist. [66]
- Diffuse SN ALPs [67] (see also [68])
- Distance ladder [69]
- Fermi-LAT (NGC 1275) [70]
- Fermi-LAT (Extragalactic SNe) [71]
- Globular clusters (R parameter) [72]
- Globular clusters (R_2 parameter) [73]
- HAWC (TeV Blazars) [74]
- HESS (PKS 2155-304) [75]
- Leo T gas temperature [76]
- Magnetic white dwarf polarization [77]
- Mrk 421 (ARGO-YBJ+Fermi): [78]
- Neutron Stars (Foster et al.) [79]
- Neutron Stars (Darling) [80]
- Neutron Stars (Battye et al.) [81]
- Solar neutrinos [82]
- SN1987A- γ [83]
- SN1987A- γ (low mass ALPs) [84]
- SN1987A- γ, ν (high mass ALPs) [85]
- Low-energy supernovae (ALP decay) [86]
- Star clusters [87]
- Telescopes (Haystack) [88]
- Telescopes (MUSE) [89]
- Telescopes (VIMOS) [90]
- Fermi galactic SN (projection) [91]
- THESEUS (projection) [92]
- eROSITA (projection) [93]
- White dwarf initial-final mass relation [94]
- XMM-Newton (decaying DM ALPs) [95]

Cosmology

- Ionisation fraction, EBL, X-rays [96]
- BBN+ N_{eff} [97]

2 Axion-electron

- EDELWEISS [98]
- Magnon non-demolition [99]
- GERDA [100]
- LUX [101]
- Panda-X [102]
- SuperCDMS [103]
- XENON1T [104, 105]
- XENONnT [in prep.]
- XENON1T (Solar basin) [106]
- Red giants (ω Cen) [107]
- Solar neutrinos [108]
- Magnons (projection) [109]
- Polaritons (projection) [110]
- DARWIN (projection) [111]
- LZ (projection) [112]
- QUAX [113, 114]
- Semiconductors (projection) [115]
- White dwarf hint [116]
- X-rays (1-loop decay) [117]

3 Axion-nucleon

Note: CASPER and nEDM limits account for stochastic correction reported in [118]

- CASPER-ZULF-Comagnetometer [119]
- CASPER-ZULF-Sidechain [120]
- nEDM (ultracold neutrons and mercury) [121]
- NASDUCK [122]
- K-3He comagnetometer [123]
- Old comagnetometers [124]
- Torsion balance [125]
- Neutron star cooling [126] (corrected from [127])
- SN1987A Cooling [128]
- SNO (deuterium dissasociation) [129]
- Proton storage ring (projection) [130]
- DM comagnetometer (projection) [124]
- CASPER-wind (projection) [120]

4 Axion-EDM

- Beam EDM [131]
- CASPER-electric [132]
- nEDM [121]
- HfF⁺ [133]
- SN1987A [134]
- *Planck*+BAO thermal axion bound [135]
- CASPER-electric (projection) [136]
- Storage Ring EDM (projection) [136]

5 Axion mass versus f_a

- BBN [137]
- Beam EDM [131]
- Binary pulsars and Solar core constraint on $\bar{\theta}$ [138]. I include minor numerical corrections made by [139, 140].
- GW170817 [141]
- HfF⁺ [133]
- nEDM [121]
- Piezoaxionic effect (projection) [142]
- SN1987A [134]
- Neutron stars (projection) [138].
- NS-NS and NS-BH Inspirals (projection) [138].

6 Axion theory predictions

6.1 Post-inflation QCD axion

- Ballesteros et al. [143]
- Buschmann et al. 2020 [144]
- Buschmann et al. 2021 [145]
- Bonati et al. [146]
- Borsanyi et al. [147]
- Berkowitz et al. [148]
- Dine et al. [149]
- Petreczky et al. [150]
- Fleury & Moore [151]
- Klaer & Moore [152]

6.2 Other dark matter predictions

- ALP Cogenesis [153]
- Early matter domination [154]
- Post-inflation ALP misalignment [155]
- Trapped misalignment ($\mathcal{Z}_{\mathcal{N}}$ axion) [139]

7 CP-violating couplings

Combined constraints [156]

Scalar-nucleon

- Red giants [157]
- MICROSCOPE [158].
- Eot-Wash [159, 160, 161]
- Irvine [162]. Corrected to 2σ limit by [163]
- HUST [164, 165, 166, 167].
- Stanford [168]
- IUPUI [169].
- Wuhan [163]

Pseudoscalar-electron

- Red giants [157]
- Eot-wash [170]
- NIST [171]
- SMILE [172].
- QUAX [173, 174]
- Washington [175, 176].
- XENON1T [177]
- Magnon (projection) [110]
- QUAX (projection) [173].

Pseudoscalar-nucleon

- Neutron star cooling [127]
- Washington [178]. Limit taken from [179].
- SMILE [172].
- Mainz [180]
- ARIADNE (projection) [181]
- CASPER-wind (projection) [136]
- DM comagnetometer (projection) [124]

8 Black hole superradiance

- Baryakhtar et al. [182] (just Stellar mass BHs)
- Mehta et al. [182] (Stellar mass and SMBHs)
- Stott [183]
- Ünal et al. [184] (Quasars)
- Cardoso et al. [185] (dark photon)

9 Dark photons

Combined constraints [186]

SM photon-DP transitions

- Coulomb [187, 188, 189, 190, 191],
- Plimpton & Lawton's experiment [192, 191]
- Atomic spectroscopy [193]
- Atomic force microscopy (AFM) [191]
- Static magnetic field of the Earth [194, 195]
- Static magnetic field of Jupiter [196, 195].
- ALPs [48]
- SPring-8 [197]
- UWA-LSW [198, 199]
- ADMX-LSW [200]
- CROWS [51].
- TEXONO [201]
- Crab nebula [202]
- COBE and FIRAS [203]

Production in stars

- CAST [204]
- SHIP [205]
- HB and RG stars [206]
- Neutron stars [207]
- Solar neutrinos [208]

Dark matter cosmology/astro

- Arias et al. [155]
- Witte et al. [209, 210]
- Caputo et al. [211, 203],
- IGM [212],
- Leo T dwarf [213]
- Gas clouds [214]

Dark matter experiments

- Reinterpreted axion limits [186]
- BREAD (projection) [35]
- DAMIC [215]
- Dark E-field Radio [216]
- DM Pathfinder [217]
- DOSUE-RR [218]
- FAST Radio antenna [219]
- FUNK [220]
- LAMPOST [221]
- MuDHI [222]
- ORPHEUS [223]
- SENSEI [224]
- SHUKET [225]
- SuperCDMS [226]
- SuperMAG [227, 228]
- SQuAD [229],
- SQMS [230],
- Tokyo dish antennae experiments [231, 232, 233]
- WISPDMS [234]
- XENON(100,1T,nT) [115, 177, 235, 236, 237, 238].

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