

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]
- QUAX [19, 20]
- RADES [21]
- RBF [22]
- SHAFT [23]
- TASEH [24]
- SuperMAG [25]
- UF [26]
- UPLOAD-DOWNLOAD [27]
- ABRACADABRA (projection) [28]
- ADBC (projection) [29]
- ADMX (projection) [30]
- aLIGO (projection) [31]
- ALPHA (projection) [32]
- BRASS (projection) [33]
- BREAD (projection) [34]
- CADEx (projection) [35]
- DM-Radio (projection) [36, 37]
- DANCE (projection) [38]
- LAMPOST (projection) [39]
- MADMAX (projection) [40]
- FLASH (projection) [41, 42]
- QUAX (projection) [43]
- ORGAN (projection) [18]
- TOORAD (projection) [44]
- WISPLC (projection) [45]
- SRF heterodyne cavity (projection) [46]

LSW/Helioscopes

- ALPS [47]
- CAST [48, 49]
- CROWS [50]
- OSQAR [51]
- PVLAS [52]
- SAPPHIRES [53]
- ALPS-II (projection) [54]
- IAXO (projection) [55]
- IAXO (Galactic SN) [56]

Astro

- Betelgeuse [57]
- Breakthrough Listen (Doppler shifted radio line in MW) [58]
- Breakthrough Listen (Neutron stars) [59]
- Bullet Cluster (archival radio data) [60]
- Chandra (Hydra) [61]
- Chandra (M87) [62]
- Chandra (NG7 1275) [63]
- Chandra (H1821+643) [64]
- Chandra (Magnetic white dwarfs) [64]
- COBE/FIRAS+Planck spectral dist. [65]
- Diffuse SN ALPs [66] (see also [67])
- Distance ladder [68]
- Fermi-LAT (NGC 1275) [69]
- Fermi-LAT (Extragalactic SNe) [70]
- Globular clusters (R parameter) [71]
- Globular clusters (R_2 parameter) [72]
- HAWC (TeV Blazars) [73]
- HESS (PKS 2155-304) [74]
- Leo T gas temperature [75]
- Magnetic white dwarf polarization [76]
- Mrk 421 (ARGO-YBJ+Fermi): [77]
- Neutron Stars (Foster et al.) [78]
- Neutron Stars (Darling) [79]
- Neutron Stars (Battye et al.) [80]
- Solar neutrinos [81]
- SN1987A- γ [82]
- SN1987A- γ (low mass ALPs) [83]
- SN1987A- γ, ν (high mass ALPs) [84]
- Low-energy supernovae (ALP decay) [85]
- Star clusters [86]
- Telescopes (Haystack) [87]
- Telescopes (MUSE) [88]
- Telescopes (VIMOS) [89]
- Fermi galactic SN (projection) [90]
- THESEUS (projection) [91]
- eROSITA (projection) [92]
- White dwarf initial-final mass relation [93]
- XMM-Newton (decaying DM ALPs) [94]

Cosmology

- Ionisation fraction, EBL, X-rays [95]
- BBN+ N_{eff} [96]

2 Axion-electron

- EDELWEISS [97]
- Magnon non-demolition [98]
- GERDA [99]
- LUX [100]
- Panda-X [101]
- SuperCDMS [102]
- XENON1T [103, 104]
- XENON1T (Solar basin) [105]
- Red giants (ω Cen) [106]
- Solar neutrinos [107]
- Magnons (projection) [108]
- Polaritons (projection) [109]
- DARWIN (projection) [110]
- LZ (projection) [111]
- QUAX [112, 113]
- Semiconductors (projection) [114]
- White dwarf hint [115]
- X-rays (1-loop decay) [116]

3 Axion-nucleon

Note: CASPER and nEDM limits account for stochastic correction reported in [117]

- CASPER-ZULF-Comagnetometer [118]
- CASPER-ZULF-Sidechain [119]
- nEDM (ultracold neutrons and mercury) [120]
- NASDUCK [121]
- K-3He comagnetometer [122]
- Old comagnetometers [123]
- Torsion balance [124]
- Neutron star cooling [125] (corrected from [126])
- SN1987A Cooling [127]
- SNO (deuterium dissasociation) [128]
- Proton storage ring (projection) [129]
- DM comagnetometer (projection) [123]
- CASPER-wind (projection) [119]

4 Axion-EDM

- CASPER-electric [130]
- nEDM [120]
- SN1987A [131]
- *Planck*+BAO thermal axion bound [132]
- CASPER-electric (projection) [133]
- Storage Ring EDM (projection) [133]

5 Axion mass versus f_a

- BBN [134]
- Binary pulsars and Solar core constraint on $\bar{\theta}$ [135]. I include minor numerical corrections made by [136, 137].
- GW170817 [138]
- nEDM [120]
- Piezoaxionic effect (projection) [139]
- SN1987A [131]
- Neutron stars (projection) [135].
- NS-NS and NS-BH Inspirals (projection) [135].

6 Axion theory predictions

6.1 Post-inflation QCD axion

- Ballesteros et al. [140]
- Buschmann et al. 2020 [141]
- Buschmann et al. 2021 [142]
- Bonati et al. [143]
- Borsanyi et al. [144]
- Berkowitz et al. [145]
- Dine et al. [146]
- Petreczky et al. [147]
- Fleury & Moore [148]
- Klaer & Moore [149]

6.2 Other dark matter predictions

- ALP Cogenesis [150]
- Early matter domination [151]
- Post-inflation ALP misalignment [152]
- Trapped misalignment (\mathcal{Z}_N axion) [136]

7 CP-violating couplings

Combined constraints [153]

Scalar-nucleon

- Red giants [154]
- MICROSCOPE [155].
- Eot-Wash [156, 157, 158]
- Irvine [159]. Corrected to 2σ limit by [160]
- HUST [161, 162, 163, 164].
- Stanford [165]
- IUPUI [166].
- Wuhan [160]

Pseudoscalar-electron

- Red giants [154]
- Eot-wash [167]
- NIST [168]
- SMILE [169].
- QUAX [170, 171]
- Washington [172, 173].
- XENON1T [174]
- Magnon (projection) [109]
- QUAX (projection) [170].

Pseudoscalar-nucleon

- Neutron star cooling [126]
- Washington [175]. Limit taken from [176].
- SMILE [169].
- Mainz [177]
- ARIADNE (projection) [178]
- CASPER-wind (projection) [133]
- DM comagnetometer (projection) [123]

8 Black hole superradiance

- Baryakhtar et al. [179] (just Stellar mass BHs)
- Mehta et al. [179] (Stellar mass and SMBHs)
- Stott [180]
- Ünal et al. [181] (Quasars)
- Cardoso et al. [182] (dark photon)

9 Dark photons

Combined constraints [183]

SM photon-DP transitions

- Coulomb [184, 185, 186, 187, 188],
- Plimpton & Lawton's experiment [189, 188]
- Atomic spectroscopy [190]
- Atomic force microscopy (AFM) [188]
- Static magnetic field of the Earth [191, 192]
- Static magnetic field of Jupiter [193, 192].
- ALPs [47]
- SPring-8 [194]
- UWA-LSW [195, 196]
- ADMX-LSW [197]
- CROWS [50].
- TEXONO [198]
- Crab nebula [199]
- COBE and FIRAS [200]

Production in stars

- CAST [201]
- SHIP [202]
- HB and RG stars [203]
- Neutron stars [204]
- Solar neutrinos [205]

Dark matter cosmology/astro

- Arias et al. [152]
- Witte et al. [206, 207]
- Caputo et al. [208, 200],
- IGM [209],
- Leo T dwarf [210]
- Gas clouds [211]
- FAST Radio observations [212]

Dark matter experiments

- Reinterpreted axion limits [183]
- BREAD (projection) [34]
- DAMIC [213]
- Dark E-field Radio [214]
- DM Pathfinder [215]
- DOSUE-RR [216]
- FUNK [217]
- LAMPOST [218]
- MuDHI [219]
- ORPHEUS [220]
- SENSEI [221]
- SHUKET [222]
- SuperCDMS [223]
- SuperMAG [224, 225]
- SQuAD [226],
- Tokyo dish antennae experiments [227, 228, 229]
- WISPDMS [230]
- XENON1T/XENON100 [114, 174, 231, 232, 233].

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