

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, 14, 15]
- CAST-CAPP [16]
- BASE [17]
- GrAHal [18]
- HAYSTAC [19, 20]
- ORGAN [21, 22]
- QUAX [23, 24, 25]
- RADES [26]
- RBF [27]
- SHAFT [28]
- TASEH [29]
- SuperMAG [30]
- UF [31]
- UPLOAD-DOWNLOAD [32]
- ABRACADABRA (projection) [33]
- ADBC (projection) [34]
- ADMX (projection) [35]
- aLIGO (projection) [36]
- ALPHA (projection) [37]
- BRASS (projection) [38]
- BREAD (projection) [39]
- CADEx (projection) [40]
- DM-Radio (projection) [41, 42]
- DANCE (projection) [43]
- LAMPOST (projection) [44]
- MADMAX (projection) [45]
- FLASH (projection) [46, 47]
- QUAX (projection) [48]
- ORGAN (projection) [21]
- TOORAD (projection) [49]
- WISPLC (projection) [50]
- SRF heterodyne cavity (projection) [51]

LSW/Helioscopes

- ALPS [52]
- CAST [53, 54]
- CROWS [55]
- OSQAR [56]
- PVLAS [57]
- SAPPHIRES [58]
- ALPS-II (projection) [59]
- IAXO (projection) [60]
- IAXO (Galactic SN) [61]

Astro

- Betelgeuse [62]
- Breakthrough Listen (Doppler shifted radio line in MW) [63]
- Breakthrough Listen (Neutron stars) [64]
- Bullet Cluster (archival radio data) [65]
- Cosmic IR background (hint) [66]
- Chandra (Hydra) [67]
- Chandra (M87) [68]
- Chandra (NG7 1275) [69]
- Chandra (H1821+643) [70]
- Chandra (Magnetic white dwarfs) [70]
- COBE/FIRAS+Planck spectral dist. [71]
- Diffuse SN ALPs [72] (see also [73])
- Distance ladder [74]
- Fermi-LAT (NGC 1275) [75]
- Fermi-LAT (Extragalactic SNe) [76]
- Fermi-LAT (Quasars) [77]
- Globular clusters (R parameter) [78]
- Globular clusters (R_2 parameter) [79]
- HAWC (TeV Blazars) [80]
- HESS (PKS 2155-304) [81]
- INTEGRAL (ALP decay) [82]
- Leo T gas temperature [83]
- Magnetic white dwarf polarization [84]
- Mrk 421 (ARGO-YBJ+Fermi): [85]
- Mrk 421 (ARGO-YBJ+MAGIC): [?]
- Neutron Stars (Foster et al.) [86]
- Neutron Stars (Darling) [87]
- Neutron Stars (Battye et al.) [88]
- Pulsar polar cap [89]
- Solar neutrinos [90]
- SN1987A- γ [91]
- SN1987A- γ (low mass ALPs) [92]
- SN1987A- γ, ν (high mass ALPs) [93]
- Low-energy supernovae (ALP decay) [94]
- Solar basin (NuSTAR) [95]
- Star clusters [96]
- Telescopes (Haystack) [97]
- Telescopes (MUSE) [98]
- Telescopes (VIMOS) [99]
- Telescopes (HST) [100]
- Fermi galactic SN (projection) [101]
- THESEUS (projection) [102]
- eROSITA (projection) [103]
- White dwarf initial-final mass relation [104]
- XMM-Newton (decaying DM ALPs) [105]

Cosmology

- Ionisation fraction, EBL, X-rays [106]
- BBN+ N_{eff} [107]
- Freeze in [108]

2 Axion-electron

- EDELWEISS [109]
- Magnon non-demolition [110]
- GERDA [111]
- LUX [112]
- Panda-X [113]
- SuperCDMS [114]
- XENON1T [115, 116]
- XENONnT [in prep.]
- XENON1T (Solar basin) [117]
- Red giants (ω Cen) [118]
- Solar neutrinos [119]
- Magnons (projection) [120]
- Polaritons (projection) [121]
- DARWIN (projection) [122]
- LZ (projection) [123]
- QUAX [124, 125]
- Semiconductors (projection) [126]
- White dwarf hint [127]
- X-rays (1-loop decay) [128]

3 Axion-nucleon

Note: CASPER and nEDM limits account for stochastic correction reported in [129]

- CASPER-ZULF-Comagnetometer [130]
- CASPER-ZULF-Sidechain [131]
- nEDM (ultracold neutrons and mercury) [132]
- NASDUCK [133, 134]
- K-3He comagnetometer (fifth force) [135]
- K-3He comagnetometer (dark matter) [136]
- Old comagnetometers [137]
- Torsion balance [138]
- Neutron star cooling [139] (corrected from [140])
- SN1987A Cooling [141]
- SNO (deuterium dissasociation) [142]
- Proton storage ring (projection) [143]
- DM comagnetometer (projection) [137]
- CASPER-wind (projection) [131]

4 Axion-EDM

- Beam EDM [144]
- CASPER-electric [145]
- nEDM [132]
- HfF⁺ [146]
- SN1987A [147]
- *Planck*+BAO thermal axion bound [148]
- CASPER-electric (projection) [149]
- Storage Ring EDM (projection) [149]

5 Axion mass versus f_a

- BBN [150]
- Beam EDM [144]
- Binary pulsars and Solar core constraint on $\bar{\theta}$ [151]. I include minor numerical corrections made by [152, 153].
- GW170817 [154]
- HfF⁺ [146]
- nEDM [132]
- Piezoaxionic effect (projection) [155]
- SN1987A [147]
- Neutron stars (projection) [151].
- NS-NS and NS-BH Inspirals (projection) [151].
- White dwarfs [156]

6 Axion theory predictions

6.1 Post-inflation QCD axion

- Ballesteros et al. [157]
- Buschmann et al. 2020 [158]
- Buschmann et al. 2021 [159]
- Bonati et al. [160]
- Borsanyi et al. [161]
- Berkowitz et al. [162]
- Dine et al. [163]
- Petreczky et al. [164]
- Fleury & Moore [165]
- Klaer & Moore [166]

6.2 Other dark matter predictions

- ALP Cogenesis [167]
- Early matter domination [168]
- Post-inflation ALP misalignment [169]
- Trapped misalignment ($\mathcal{Z}_{\mathcal{N}}$ axion) [152]

7 CP-violating couplings

Combined constraints [170]

Scalar-nucleon

- Red giants [171]
- MICROSCOPE [172].
- Eot-Wash [173, 174, 175]
- Irvine [176]. Corrected to 2σ limit by [177]
- HUST [178, 179, 180, 181].
- Stanford [182]
- IUPUI [183].
- Wuhan [177]

Pseudoscalar-electron

- Red giants [171]
- Eot-wash [184]
- NIST [185]
- SMILE [186].
- QUAX [187, 188]
- Washington [189, 190].
- XENON1T [191]
- Magnon (projection) [121]
- QUAX (projection) [187].

Pseudoscalar-nucleon

- Neutron star cooling [140]
- Washington [192]. Limit taken from [193].
- SMILE [186].
- Mainz [194]
- ARIADNE (projection) [195]
- CASPER-wind (projection) [149]
- DM comagnetometer (projection) [137]

8 Black hole superradiance

- Baryakhtar et al. [196] (just Stellar mass BHs)
- Mehta et al. [196] (Stellar mass and SMBHs)
- Stott [197]
- Ünal et al. [198] (Quasars)
- Cardoso et al. [199] (dark photon)

9 Dark photons

Combined constraints [200]

SM photon-DP transitions

- Coulomb [201, 202, 203, 204, 205],
- Plimpton & Lawton's experiment [206, 205]
- Atomic spectroscopy [207]
- Atomic force microscopy (AFM) [205]
- Static magnetic field of the Earth [208, 209, 210]
- Static magnetic field of Jupiter [211, 210].
- ALPs [52]
- SPring-8 [212]
- UWA-LSW [213, 214]
- ADMX-LSW [215]
- CROWS [55].
- TEXONO [216]
- Crab nebula [217]
- COBE and FIRAS [218]

Production in stars

- CAST [219]
- SHIP [220]
- HB and RG stars [221]
- Neutron stars [222]
- Solar neutrinos [223]

Dark matter cosmology/astro

- Arias et al. [169]
- Witte et al. [224, 225]
- Caputo et al. [226, 218],
- IGM [227],
- Leo T dwarf [228]
- Gas clouds [229]

Dark matter experiments

- Reinterpreted axion limits [200]
- BREAD (projection) [39]
- DAMIC [230]
- Dark E-field Radio [231]
- DM Pathfinder [232]
- DOSUE-RR [233]
- FAST Radio antenna [234]
- FUNK [235]
- LAMPOST [236]
- MuDHI [237]
- ORPHEUS [238]
- QUALIPHIDE [239]
- Quantum cyclotron [240]
- SENSEI [241]
- SHUKET [242]
- SuperCDMS [243]
- SuperMAG [244, 245]
- SQuAD [246],
- SQMS [247],
- Tokyo dish antennae experiments [248, 249, 250]
- WISPDMS [251]
- XENON(100,1T,nT) [126, 191, 252, 253, 254, 255].

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