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]
- DANCE [17]
- BASE [18]
- GrAHal [19]
- HAYSTAC [20, 21, 22]
- ORGAN [23, 24]
- QUAX [25, 26, 27]
- RADES [28]
- RBF [29]
- SHAFT [30]
- TASEH [31]
- SuperMAG [32]
- UF [33]
- UPLOAD-DOWNLOAD [34, 35]
- ABRACADABRA (projection) [36]
- ADBC (projection) [37]
- ADMX (projection) [38]
- aLIGO (projection) [39]
- ALPHA (projection) [40, 41]
- BRASS (projection) [42]
- BREAD (projection) [43]
- CADEx (projection) [44]
- DALI (projection) [45]
- DM-Radio (projection) [46, 47]
- DANCE (projection) [48]
- LAMPOST (projection) [49]
- MADMAX (projection) [50]
- FLASH (projection) [51, 52]
- QUAX (projection) [53]
- ORGAN (projection) [23]
- TOORAD (projection) [54]
- Twisted Anyon Cavity (projection) [55]
- WISPLC (projection) [56]
- SRF heterodyne cavity (projection) [57]

LSW/Helioscopes

- ALPS [58]
- CAST [59, 60]
- CROWS [61]
- OSQAR [62]
- PVLAS [63]
- SAPPHIRES [64, 65]
- ALPS-II (projection) [66]
- IAXO (projection) [67]
- IAXO (Galactic SN) [68]

Astro

- Axion star explosions [69]
- Betelgeuse [70]
- BICEP/KECK [71]
- Breakthrough Listen (Doppler shifted radio line in MW) [72]
- Bullet Cluster (archival radio data) [73]
- Cosmic IR background (hint) [74]
- Chandra (Hydra) [75]
- Chandra (M87) [76]
- Chandra (NG7 1275) [77]
- Chandra (H1821+643) [78]
- CMB Anisotropies [79, 80]
- COBE/FIRAS+Planck spectral dist. [81]
- Diffuse gamma-rays [82]
- Diffuse SN ALPs [83] (see also [84])
- Distance ladder [85]
- Fermi-LAT (NGC 1275) [86]
- Fermi-LAT (Extragalactic SNe) [87]
- Fermi-LAT (Quasars) [88]
- Gamma-ray attenuation (ALP dark matter) [89]
- Globular clusters (R parameter) [90]
- Globular clusters (R_2 parameter) [91]
- HAWC (TeV Blazars) [92]
- HESS (PKS 2155-304) [93]
- INTEGRAL (ALP decay) [94]
- Leo T gas temperature [95]
- Magnetic white dwarfs (X-rays) [96]
- Magnetic white dwarf (polarization) [97]
- MOJAVE [98]
- Mrk 421 (ARGO-YBJ+Fermi): [99]
- Mrk 421 (ARGO-YBJ+MAGIC): [100]
- Neutron Stars (Foster et al. 2020) [101]
- Neutron Stars (Darling 2020) [102]
- Neutron Stars (Battye et al. 2021) [103]
- Neutron stars (Foster et al. 2022) [104]
- Neutron Stars (Battye et al. 2023) [105]
- Planck cosmic birefringence [106]
- POLARBEAR [107]
- PPTA+QUIJOTE [108]
- Pulsar polarisation arrays (projection) [109]
- Pulsar polar cap [110]
- Red supergiant [111]
- Solar neutrinos [112]
- SN1987A-γ (ALP decay) [113, 114]
- SN1987A-γ (low mass ALP conversion) [115, 114]
- SN1987A-γ,ν (high mass ALPs) [116]
- Low-energy supernovae (ALP decay) [82]
- Solar basin (NuSTAR) [117]
- Solar basin (NuSTAR and SPHINX) [118]
- Star clusters [119]
- SPT [120]
- Telescopes (Haystack) [121]
- Telescopes (MUSE) [122]
- Telescopes (VIMOS) [123]
- Telescopes (HST) [124, 125]
- Fermi galactic SN (projection) [126]
- THESEUS (projection) [127]
- eROSITA (projection) [128]
- White dwarf initial-final mass relation [129]
- XMM-Newton (decaying DM ALPs) [130]

Cosmology

- Ionisation fraction, EBL, X-rays [131]
- BBN+$N_{\rm eff}$ [132]
- Freeze in [133]

2 Heavy ALP-photon coupling

- ATALS (PbPb) [134]
- BaBar [135]
- Beam dump [136, 137, 135, 138, 139]
- Belle II [140]
- BESIII [141]
- CMS (PbPb) [142]
- LEP [143]
- LHC (pp)[144]
- NOMAD [145]
- OPAL [144]
- PrimEx [146, 147]
- CONUS (projection) [148]
- DUNE (projection) [149]
- FASER LLP (projection) [150]

3 Axion-electron

- EDELWEISS [151]
- Magnon non-demolition [152]
- DarkSide-50 [153]
- GERDA [154]
- LUX [155]
- Panda-X [156]
- SuperCDMS [157]
- XENON1T [158, 159]
- XENONnT [160]
- XENON1T (Solar basin) [161]
- Red giants (ωCen) [162]
- NV Centers (projection) [163]
- Solar neutrinos [164]
- Magnons (projection) [165]
- Polaritons (projection) [166]
- DARWIN (projection) [167]
- LZ (projection) [168]
- QUAX [169, 170]
- Semiconductors (projection) [171]
- White dwarf hint [172]
- Freeze-in irreducible axions [133]
- X-rays (1-loop decay) [173]

4 Axion-nucleon

Note: CASPEr and nEDM limits account for stochastic correction reported in [174]

- Casimir effect (fifth force) [175]
- CASPEr-ZULF-Comagnetometer [176]
- CASPEr-ZULF-Sidechain [177]
- nEDM (ultracold neutrons and mercury) [178]
- NASDUCK [179, 180]
- PSI HgM (nEDM) [181]
- K-3He comagnetometer (fifth force) [182]
- K-3He comagnetometer (dark matter) [183]
- JEDI [184]
- Old comagnetometers [185]
- Torsion balance [186]
- Neutron star cooling [187] (corrected from [188])
- SN1987A Cooling [189]
- SNO (deuterium dissasociation) [190]
- Proton storage ring (projection) [191]
- DM comagnetometer (projection) [185]
- CASPEr-gradient (projection) [177]
- Superfluid helium-3 HPD (projection) [192]

5 Axion-EDM

- Axinovae [193]
- Beam EDM [194]
- BBN (dark matter) [195]
- CASPEr-electric [196]
- nEDM [178]
- HfF^+ [197]
- JEDI [184]
- Rb/Quartz [198]
- SN1987A [199]
- *Planck*+BAO thermal axion bound [200]
- CASPEr-electric (projection) [201]
- Storage Ring EDM (projection) [201]

6 Axion mass versus f_a

- BBN (dark matter) [195]
- Beam EDM [194]
- Binary pulsars and Solar core constraint on $\bar{\theta}$ [202]. I include minor numerical corrections made by [203, 204].
- GW170817 [205]
- HfF^+ [197]
- Rb/Quartz [198]
- JEDI [184]
- nEDM [178]
- Piezoaxionic effect (projection) [206]
- *Planck*+BAO thermal axion bound [200]
- SN1987A [199]
- Neutron stars (projection) [202].
- NS-NS and NS-BH Inspirals (projection) [202].
- White dwarfs [207]

6.1 Black hole superradiance

- Baryakhtar et al. [208] (just Stellar mass BHs)
- Mehta et al. [208] (Stellar mass and SMBHs)
- Stott [209]
- Ünal et al. [210] (Quasars)
- Cardoso et al. [211] (dark photon)

7 Axion theory predictions

7.1 Post-inflation QCD axion

- Ballesteros et al. [212]
- Buschmann et al. 2020 [213]
- Buschmann et al. 2021 [214]
- Bonati et al. [215]
- Borsanyi et al. [216]
- Berkowitz et al. [217]
- Dine et al. [218]
- Petreczky et al. [219]
- Fleury & Moore [220]
- Klaer & Moore [221]
- Gorghetto et al. [222]
- Saikawa et al. [67]

7.2 Other dark matter predictions

- ALP Cogenesis [223]
- Early matter domination [224]
- Post-inflation ALP misalignment [225, 226]
- Trapped misalignment ($\mathcal{Z}_N$ axion) [203]

8 CP-violating couplings

Combined constraints [227]

Scalar-nucleon

- Red giants [228]
- MICROSCOPE [229].
- Eot-Wash [230, 231, 232]
- Irvine [233]. Corrected to 2σ limit by [234]
- HUST [235, 236, 237, 238].
- Stanford [239]
- IUPUI [240].
- Wuhan [234]

Pseudoscalar-electron

- Red giants [228]
- Eot-wash [241]
- NIST [242]
- SMILE [243].
- QUAX [244, 245]
- Washington [246, 247].
- XENON1T [248]
- Magnon (projection) [166]
- QUAX (projection) [244].

Pseudoscalar-nucleon

- Neutron star cooling [188]
- Washington [249]. Limit taken from [250].
- SMILE [243].
- Mainz [251]
- Moon/Earth [252]
- ARIADNE (projection) [253]
- CASPEr-wind (projection) [201]
- DM comagnetometer (projection) [185]

9 Scalars

Scalar-photon

- Globular clusters [91]
- Eot-Wash (EP) [254]
- Fifth force [255]
- MICROSCOPE [229]
- AURIGA [256]
- BACON [257]
- Cs/Cav [258]
- DAMNED [259]
- Dy/Dy [260]
- Dy/Quartz [198]
- Dynamic Decoupling [261]
- GEO600 [262]
- Holometer [263]
- H/Quartz/Sapphire [264]
- PTB (Yb+, Sr clock) [265]
- I_2 [266]
- Rb/Cs [267]
- Sr/Si [268]
- AEDGE (projection) [269]
- AION (projection) [269]
- DUAL (projection) [255]
- MAGIS (projection) [270]
- Nuclear clock (projection) [271]
- Mechanical Resonators (projection) [272]

Scalar-electron

- Red giants [228]
- White dwarfs [273]
- Eot-Wash (EP) [254]
- Fifth force [255]
- MICROSCOPE [229]
- AURIGA [256]
- Cs/Cav [258]
- DAMNED [259]
- GEO600 [262]
- Holometer [263]
- H/Quartz/Sapphire [264]
- I_2 [266]
- H/Si [268]
- Rb/Quartz [198]
- AEDGE (projection) [269]
- AION (projection) [269]
- DUAL (projection) [255]
- Optical microwave clock (projection) [255]
- Optical cavities [274]
- SrOH [275]
- Mechanical Resonators (projection) [272]
- IPTA (mock data) [276]

10 Vectors

B-L coupling

- Casimir [277, 278, 279]
- Eot-Wash (EP) [280]
- Eot-Wash (ISL) [281]
- MICROSCOPE [282]
- DM stability [283]
- Horizontal branch [228]
- Sun [228]
- Eot-Wash (DM) [284]
- LIGO (O1) [285]
- LIGO/VIRGO [285]
- Asteroids (projection) [286]
- LISA (projection) [286]
- MAGIS (projection) [270]
- Optomechanical membranes (projection) [287]
- SKA (projection) [288]
- Torsion balance (projection) [288]

11 Dark photons

Combined constraints [289]

SM photon-DP transitions

- Coulomb [290, 291, 292, 293, 294],
- Plimpton & Lawton's experiment [295, 294]
- Atomic spectroscopy [296]
- Atomic force microscopy (AFM) [294]
- Static magnetic field of the Earth [297, 298, 299]
- Static magnetic field of Jupiter [300, 299].
- ALPs [58]
- ALPS-II (projection) [301]
- SPring-8 [302]
- UWA-LSW [303, 304]
- ADMX-LSW [305]
- CROWS [61].
- DarkSRF [306]
- DarkSRF (projection) [307]
- TEXONO [308]
- Crab nebula [309]
- COBE and FIRAS [310]
- STAX (projection) [311]

Production in stars

- CAST [312]
- SHIPS [313]
- HINODE [314]
- HB and RG stars [315]
- Neutron stars [316]
- Solar neutrinos [317]
- XENON1T [318]

Dark matter cosmology/astro

- Arias et al. [225]
- Witte et al. [319, 320]
- Caputo et al. [321, 310],
- IGM [322],
- Leo T dwarf [323]
- Gas clouds [324]

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Dark matter experiments

- Reinterpreted axion limits [289]
- ALPHA []
- BREAD (projection) [43]
- DarkSide-50 [153]
- DAMIC [325]
- Dark E-field Radio [326]
- DM Pathfinder [327]
- DOSUE-RR [328]
- FAST Radio antenna [329]
- FUNK [330]
- LAMPOST [331]
- LOFAR (solar corona) [332]
- MuDHI [333]
- ORGAN [334]
- ORPHEUS [335]
- QUALIPHIDE [336]
- Quantum cyclotron [337]
- SENSEI [338]
- SHUKET [339]
- SuperCDMS [340]
- SuperMAG [341, 342]
- SQuAD [343],
- SQMS [344],
- Tokyo dish antennae experiments [345, 346, 347]
- WISPDMX [348]
- XENON(100,1T,nT) [171, 248, 349, 350, 318, 351].

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