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

Cosmology

- Ionisation fraction, EBL, X-rays [126]
- BBN+$N_{\rm eff}$ [127]
- Freeze in [128]

2 Heavy ALP-photon coupling

- ATALS (PbPb) [129]
- BaBar [130]
- Beam dump [131, 132, 130, 133, 134]
- Belle II [135]
- BESIII [136]
- CMS (PbPb) [137]
- LEP [138]
- LHC (pp)[139]
- NOMAD [140]
- OPAL [139]
- PrimEx [141, 142]
- CONUS (projection) [143]
- DUNE (projection) [144]
- FASER LLP (projection) [145]

3 Axion-electron

- EDELWEISS [146]
- Magnon non-demolition [147]
- GERDA [148]
- LUX [149]
- Panda-X [150]
- SuperCDMS [151]
- XENON1T [152, 153]
- XENONnT [154]
- XENON1T (Solar basin) [155]
- Red giants (ωCen) [156]
- NV Centers (projection) [157]
- Solar neutrinos [158]
- Magnons (projection) [159]
- Polaritons (projection) [160]
- DARWIN (projection) [161]
- LZ (projection) [162]
- QUAX [163, 164]
- Semiconductors (projection) [165]
- White dwarf hint [166]
- Freeze-in irreducible axions [128]
- X-rays (1-loop decay) [167]

4 Axion-nucleon

Note: CASPEr and nEDM limits account for stochastic correction reported in [168]

- Casimir effect (fifth force) [169]
- CASPEr-ZULF-Comagnetometer [170]
- CASPEr-ZULF-Sidechain [171]
- nEDM (ultracold neutrons and mercury) [172]
- NASDUCK [173, 174]
- PSI HgM (nEDM) [175]
- K-3He comagnetometer (fifth force) [176]
- K-3He comagnetometer (dark matter) [177]
- JEDI [178]
- Old comagnetometers [179]
- Torsion balance [180]
- Neutron star cooling [181] (corrected from [182])
- SN1987A Cooling [183]
- SNO (deuterium dissasociation) [184]
- Proton storage ring (projection) [185]
- DM comagnetometer (projection) [179]
- CASPEr-gradient (projection) [171]
- Superfluid helium-3 HPD (projection) [186]

5 Axion-EDM

- Beam EDM [187]
- BBN (dark matter) [188]
- CASPEr-electric [189]
- nEDM [172]
- HfF^+ [190]
- JEDI [178]
- Rb/Quartz [191]
- SN1987A [192]
- *Planck*+BAO thermal axion bound [193]
- CASPEr-electric (projection) [194]
- Storage Ring EDM (projection) [194]

6 Axion mass versus f_a

- BBN (dark matter) [188]
- Beam EDM [187]
- Binary pulsars and Solar core constraint on $\bar{\theta}$ [195]. I include minor numerical corrections made by [196, 197].
- GW170817 [198]
- HfF^+ [190]
- Rb/Quartz [191]
- JEDI [178]
- nEDM [172]
- Piezoaxionic effect (projection) [199]
- *Planck*+BAO thermal axion bound [193]
- SN1987A [192]
- Neutron stars (projection) [195].
- NS-NS and NS-BH Inspirals (projection) [195].
- White dwarfs [200]

6.1 Black hole superradiance

- Baryakhtar et al. [201] (just Stellar mass BHs)
- Mehta et al. [201] (Stellar mass and SMBHs)
- Stott [202]
- Ünal et al. [203] (Quasars)
- Cardoso et al. [204] (dark photon)

7 Axion theory predictions

7.1 Post-inflation QCD axion

- Ballesteros et al. [205]
- Buschmann et al. 2020 [206]
- Buschmann et al. 2021 [207]
- Bonati et al. [208]
- Borsanyi et al. [209]
- Berkowitz et al. [210]
- Dine et al. [211]
- Petreczky et al. [212]
- Fleury & Moore [213]
- Klaer & Moore [214]
- Gorghetto et al. [215]
- Saikawa et al. [67]

7.2 Other dark matter predictions

- ALP Cogenesis [216]
- Early matter domination [217]
- Post-inflation ALP misalignment [218, 219]
- Trapped misalignment ($\mathcal{Z}_N$ axion) [196]

8 CP-violating couplings

Combined constraints [220]

Scalar-nucleon

- Red giants [221]
- MICROSCOPE [222].
- Eot-Wash [223, 224, 225]
- Irvine [226]. Corrected to 2σ limit by [227]
- HUST [228, 229, 230, 231].
- Stanford [232]
- IUPUI [233].
- Wuhan [227]

Pseudoscalar-electron

- Red giants [221]
- Eot-wash [234]
- NIST [235]
- SMILE [236].
- QUAX [237, 238]
- Washington [239, 240].
- XENON1T [241]
- Magnon (projection) [160]
- QUAX (projection) [237].

Pseudoscalar-nucleon

- Neutron star cooling [182]
- Washington [242]. Limit taken from [243].
- SMILE [236].
- Mainz [244]
- ARIADNE (projection) [245]
- CASPEr-wind (projection) [194]
- DM comagnetometer (projection) [179]

9 Scalars

Scalar-photon

- Globular clusters [90]
- Eot-Wash (EP) [246]
- Fifth force [247]
- MICROSCOPE [222]
- AURIGA [248]
- BACON [249]
- Cs/Cav [250]
- DAMNED [251]
- Dy/Dy [252]
- Dy/Quartz [191]
- Dynamic Decoupling [253]
- GEO600 [254]
- Holometer [255]
- H/Quartz/Sapphire [256]
- PTB (Yb+, Sr clock) [257]
- I_2 [258]
- Rb/Cs [259]
- Sr/Si [260]
- AEDGE (projection) [261]
- AION (projection) [261]
- DUAL (projection) [247]
- MAGIS (projection) [262]
- Nuclear clock (projection) [263]
- Mechanical Resonators (projection) [264]

Scalar-electron

- Red giants [221]
- White dwarfs [265]
- Eot-Wash (EP) [246]
- Fifth force [247]
- MICROSCOPE [222]
- AURIGA [248]
- Cs/Cav [250]
- DAMNED [251]
- GEO600 [254]
- Holometer [255]
- H/Quartz/Sapphire [256]
- I_2 [258]
- H/Si [260]
- Rb/Quartz [191]
- AEDGE (projection) [261]
- AION (projection) [261]
- DUAL (projection) [247]
- Optical microwave clock (projection) [247]
- Optical cavities [266]
- SrOH [267]
- Mechanical Resonators (projection) [264]
- IPTA (mock data) [268]

10 Vectors

B-L coupling

- Casimir [269, 270, 271]
- Eot-Wash (EP) [272]
- Eot-Wash (ISL) [273]
- MICROSCOPE [274]
- DM stability [275]
- Horizontal branch [221]
- Sun [221]
- Eot-Wash (DM) [276]
- LIGO (O1) [277]
- LIGO/VIRGO [277]
- Asteroids (projection) [278]
- LISA (projection) [278]
- MAGIS (projection) [262]
- Optomechanical membranes (projection) [279]
- SKA (projection) [280]
- Torsion balance (projection) [280]

11 Dark photons

Combined constraints [281]

SM photon-DP transitions

- Coulomb [282, 283, 284, 285, 286],
- Plimpton & Lawton's experiment [287, 286]
- Atomic spectroscopy [288]
- Atomic force microscopy (AFM) [286]
- Static magnetic field of the Earth [289, 290, 291]
- Static magnetic field of Jupiter [292, 291].
- ALPs [58]
- ALPS-II (projection) [293]
- SPring-8 [294]
- UWA-LSW [295, 296]
- ADMX-LSW [297]
- CROWS [61].
- DarkSRF [298]
- DarkSRF (projection) [299]
- TEXONO [300]
- Crab nebula [301]
- COBE and FIRAS [302]
- STAX (projection) [303]

Production in stars

- CAST [304]
- SHIPS [305]
- HINODE [306]
- HB and RG stars [307]
- Neutron stars [308]
- Solar neutrinos [309]
- XENON1T [310]

Dark matter cosmology/astro

- Arias et al. [218]
- Witte et al. [311, 312]
- Caputo et al. [313, 302],
- IGM [314],
- Leo T dwarf [315]
- Gas clouds [316]

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Dark matter experiments

- Reinterpreted axion limits [281]
- ALPHA []
- BREAD (projection) [43]
- DAMIC [317]
- Dark E-field Radio [318]
- DM Pathfinder [319]
- DOSUE-RR [320]
- FAST Radio antenna [321]
- FUNK [322]
- LAMPOST [323]
- LOFAR (solar corona) [324]
- MuDHI [325]
- ORGAN [326]
- ORPHEUS [327]
- QUALIPHIDE [328]
- Quantum cyclotron [329]
- SENSEI [330]
- SHUKET [331]
- SuperCDMS [332]
- SuperMAG [333, 334]
- SQuAD [335],
- SQMS [336],
- Tokyo dish antennae experiments [337, 338, 339]
- WISPDMX [340]
- XENON(100,1T,nT) [165, 241, 341, 342, 310, 343].

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