Observational constraints on the wave-CDM particle mass m_a

Include bounds — allowed / favoured regions

- Arbey et al. 2001 — Spiral galaxy *static solution of KGE, excited states*
- Silverman et al. 2002 — M31, M33 RC *static ansatz solution of GPE*
- Maleki et al. 2020a — MW RC *soliton + NFW*
- Maleki et al. 2020b — NGC 6240 solitonic core collision *superposition of two soliton*
- Amorisco et al. 2018 — MW stellar streams *stream morphology* (*tidal disruption*)
- Dentler et al. 2021 — weak lensing *cosmic − shear P(k)*
- Porayko et al. 2018 — Pulsar timing array (PPTA) *timing residuals, stat. search*
- Li et al. 2014 — CMB, BBN *KDE numerics*
- Hlozek et al. 2015 — CMB, LSS (WiggleZ) *linear − perturbation MCMC*
- Iršič et al. 2017 — Lyα forest (XQ-100, HIRES/MIKE) *Lyα P(k)*
- Kobayashi et al. 2017 — Lyα (HIRES/MIKE, XQ-100) *Lyα forest* (*MCMC*)
- Lidz et al. 2018 — 21cm (EDGES, z~15-20) *21cm coupling timing, HMF*
- Schneider 2018 — 21cm (EDGES, z~15.5-19.5) *semi − analytic*
- Nebrin et al. 2019 — 21cm (EDGES HB, Cosmic Dawn) *21cm absorption width, anal.*
- Nori et al. 2019 — Lyα forest *Lyα P(k), AX − GADGET sim.*
- Rogers et al. 2021 — Lyα forest (HIRES/MIKE, XQ-100) *Lyα P(k), emulator + MCMC*
- Zimmermann et al. 2025 — Leo II stellar kin. *static eigenstate expansions*
- Lancaster et al. 2020 — Fornax dSph GC timing *dynamical friction*
- Schutz 2020 — strong lens + streams *SHMF*
- Nadler et al. 2021 — MW satellites *SHMF*
- Nadler et al. 2024 — COZMIC I *SHMF, zoom − in N − body*
- Church et al. 2019 — MW disk-star kin. *disk heating, granule fluct.*
- Marsh et al. 2019 — Eri II + MW SHMF *SC heating, granule fluct.*
- Dalal et al. 2022 — Segue I & II UFD *dynamical heating, granule fluct.*
- Teodori et al. 2025 — Fornax/Carina/Leo II *stellar dynamics, sim.*
- Marsh et al. 2015 — Fornax, Sculptor (*ground state*) *soliton + NFW*
- Chen et al. 2017 — 8 classical dSphs stellar kin. *Jeans analysis, soliton + NFW*
- González-Morales et al. 2017 — Fornax, Sculptor *Jeans analysis, soliton + NFW*
- Hayashi et al. 2021 — Segue I *Jeans analysis, soliton + NFW*
- Benito et al. 2025 — 27 UFDs, core radius-stellar mass scaling *SH relation*
- Wardana et al. 2026 — 8 MW dSphs *SH relation, soliton + NFW*

Exclude bounds — ruled-out regions

- Bar et al. 2019a — M87*, Sgr A* *SH relation*
- Davies et al. 2020 — M87, MW *SH relation*
- Powell et al. 2023 — Strong lens (MG J0751+2716) *granule perturbation*
- Laroche et al. 2022 — strong lenses *HMF, c − M relation, etc.*
- Davoudiasl et al. 2019 — M87* (EHT) *BH superradiance*
- Stott 2018 — BH spin catalog (stellar + SMBH) *BH superradiance*
- Armengaud et al. 2017 — Lyα forest (SDSS/BOSS) *Lyα P(k)*
- Bar et al. 2018 — SPARC RCs *SH relation, static ground state*
- Bar et al. 2019b — SPARC LSBs + MW *SH relation, static ground state*
- Safarzadeh et al. 2020 — MW dSphs & UFDs *SH relation*
- Bar et al. 2022 — SPARC RCs *SH relation vs RC*

10^{-26} 10^{-25} 10^{-24} 10^{-23} 10^{-22} 10^{-21} 10^{-20} 10^{-19} 10^{-18}

$\log_{10}(m_a/\mathrm{eV})$

Include · Exclude · ▸ Open end