INVISIBLES24

How to rule out $(g-2)_\mu$ + Hubble tension in $L_\mu - L_\tau$ with white dwarf cooling

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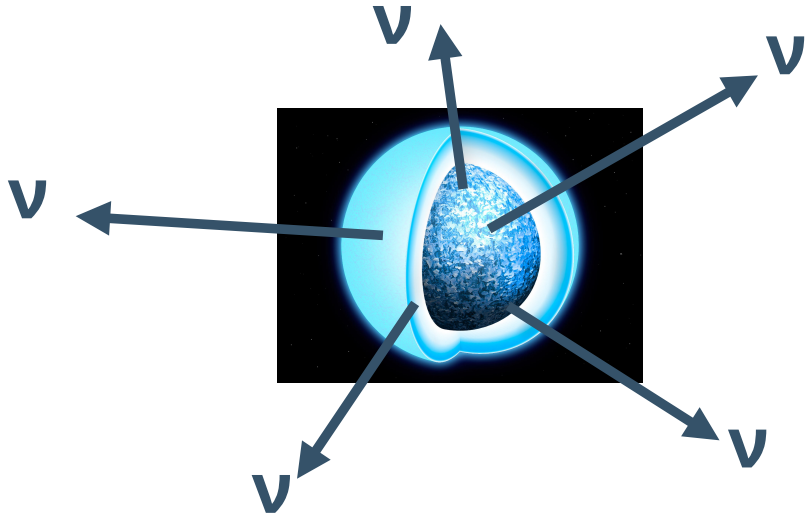
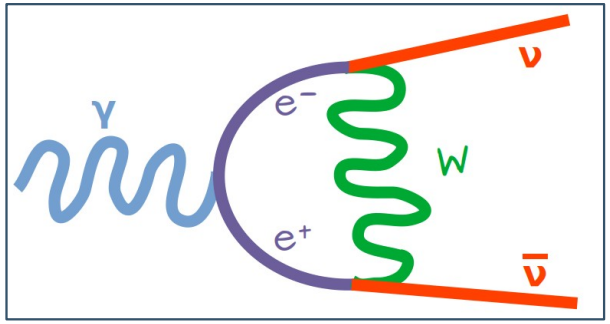
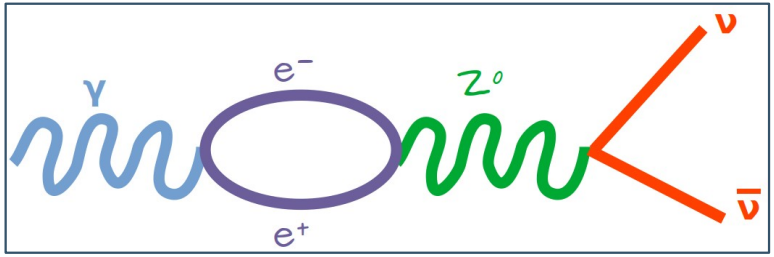
arXiv:2405.00094

WD cooling

- $T \gtrsim 10^{7.8}$ K: Hot WD
- Plasmon decay

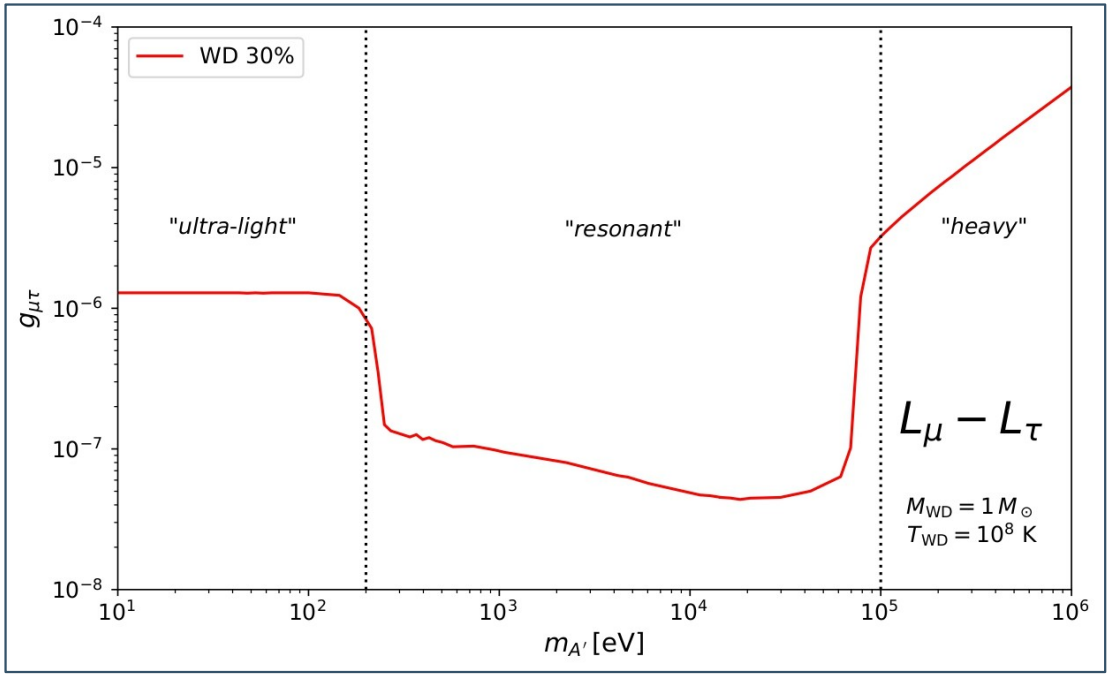


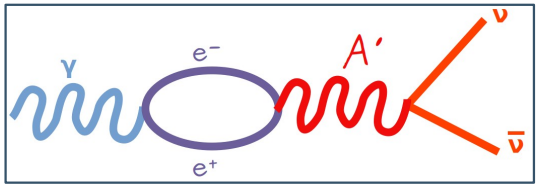


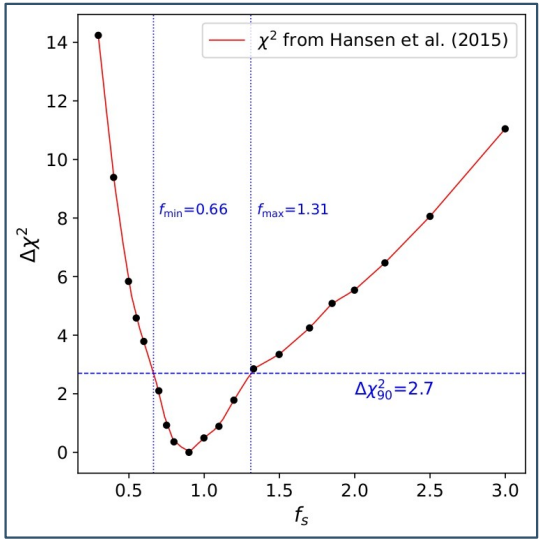


Contribution from dark photon in $L_\mu - L_\tau$

- **Interactions: 2nd and 3rd generations of leptons, 1st through 1-loop kinetic mixing**

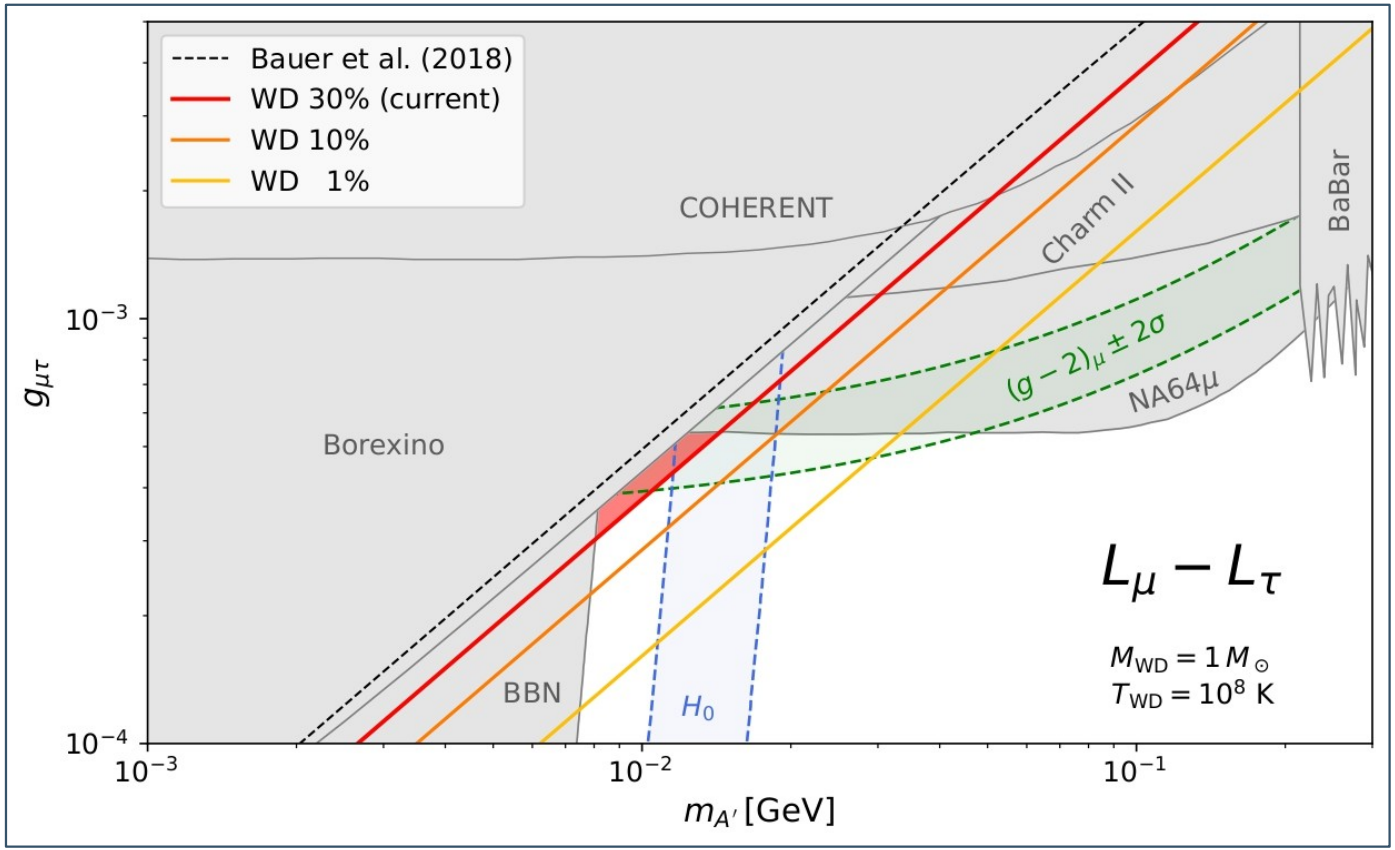






From observations of the Globular Cluster 47 Tucanae

Ruling out the double explanation



Thank you!

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BACKUP 1: Other limits on A’

- **BBN:** masses $\lesssim$ 10 MeV heat ν-gas in early universe → higher ΔN_{eff}
- **NA64μ:** missing energy-momentum with high energy μ beam
- **Borexino:** measurements of ^{7}Be solar neutrino flux
- **BaBar:** resonance searches in four-muon production
- **COHERENT:** measurements of CEνNS with CsI[Na] target
- **CHARM-II:** search of ν trident production

BACKUP 2: Plasma frequency for our simulation