

12th Iberian Gravitational Waves Meeting



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Search for Proca star mergers in GWTC-3

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Vector boson stars, also known as Proca stars, are self-gravitating lumps of dark matter sourced by an ultralight vector bosonic particle. We find 4 short signals in the latest gravitational wave catalogue GWTC-3, including the events GW190426, GW190521, and GW200220 and a trigger S200114f; and compare them to a catalogue of ~ 800 numerical simulations of head-on mergers of such exotic compact binaries. Our result shows that GW190521 and S200114f are more favoured to be Proca stars mergers than binary black holes merger; whereas GW200220 and GW190426 are not. On top of that, the mass of the ultralight bosons inferred from these signals are consistent with each other, at around 9×10^{-13} eV, except for the trigger S200114f which slightly deviates from that.

Which topic best fits your talk?

Cosmological Sources of GW

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