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Ultralight dark matter search with KAGRA -O3GK result and what's next?-

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Among various dark matter (DM) candidates, ultralight bosonic fields can be explored by using gravitational wave laser interferometers. For example, massive vector fields weakly coupled to the standard model particles yield oscillating forces acting on the test masses. In this context, KAGRA has a unique feature due to differing compositions of its mirrors, enhancing the signal of vector DM in the length change in the auxiliary channels. Here I present the first result of $U(1)_{B-L}$ gauge boson DM search using the KAGRA data from O3GK run. The result is derived from a newly developed pipeline, which properly takes into account the stochastic nature of ultralight DM. I'll also discuss the application of our pipeline to the planned axion DM search.

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