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qBounce using Gravity Resonance Spectroscopy Dark Energy and Dark Matter searches

Tuesday 19 July 2022 15:10 (10 minutes)

I present qBounce using the novel high precision method of Gravity Resonance Spectroscopy (GRS) using Ramseys method of separated oscillating fields.
It utilises ultracold neutrons bound to the surface of a mirror by gravity. Because of the zero charge and low polarizability of the neutron, this system is insensitive to many external influences. In 2018, the first proof of principle of GRS was published. Since then, improvements to the experimental setup were investigated and implemented to allow for higher precision and stability of the system. During 2020 and 2021,
the spectrometer showed its full potential, and precision measurements of the transition frequency between bound states were taken.
In my contribution, I will present the technique and possibilities to apply this method for dark matter and dark energy searches.

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