Phenomenology 2025 Symposium



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Effect of Axion Dark Matter on g-2 of the Electron

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If dark matter is ultralight, the number density of dark matter is very high and the techniques of zerotemperature field theory are no longer valid. The dark matter number density modifies the vacuum giving it a non-negligible particle occupation number. For fermionic dark matter, this occupation number can be no larger than one. However, in the case of bosons the occupation number is unbounded. If there is a large occupation number, the Bose enhancement needs to be taken into consideration for any process involving particles which interact with the dark matter. Because the occupation number scales inversely with the dark matter mass, this effect is most prominent for ultralight dark matter. If we consider axion-like particles, the corrections to the electron anomalous magnetic moment from the Bose enhancement effect would provide new constraints on the axion electron and axion photon couplings.

Mini Symposia (Invited Talks Only)

Plenary (Invited talks only)

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