Bandwidths Broadening in Ultra-light dark Matter Search with Alkali-noble-gas Apin Systems

Thursday 10 July 2025 14:50 (20 minutes)

Alkali-noble-gas spin systems have been widely used in searches for ultra-light dark matter coupling to nucleon spins. These searches usually confronted limitations of bandwidth and sensitivity. In this talk, we demonstrated two strategies to broaden the sensitive bandwidths in dark matter searches with alkali-noble-gas spin systems. The system has been implemented in the hybrid spin-coupled regimes in the first strategy. We finally achieved leading sensitivity in the frequency range $[10^{-2}, 10^{-3}]$ Hz. In the second strategy, we effectively broadened the width of the spin resonant search by 30-fold, and finally set the most stringent limit for axion-neutron coupling in the 4.5–15.5 Hz frequency range.

Author: HE, Yuxuan

Presenter: HE, Yuxuan

Session Classification: Parallel 2