

Probe Fundamental Symmetry and BSM Physics Via the Primakoff Effect

Thursday, 19 October 2023 14:00 (30 minutes)

The fundamental QCD symmetries at low energies and the new physics Beyond the Standard Model (BSM) are two frontiers in the contemporary physics. The Primakoff effect, a process of high-energy photo- or electro-production of mesons in the Coulomb field of a target offers a powerful experimental tool to explore both fundamental issues. A comprehensive Primakoff experimental program has been developed at Jefferson Laboratory (JLab) to perform precision measurements of the two-photon decay widths and the transition form factors of π^0 , η and η' and to search for dark scalars or pseudoscalars via the Primakoff effect. A measurement of the π^0 radiative decay width was carried out at JLab 6 GeV and the published result achieved a precision of 1.5%. The data collection for the η radiative decay width measurement at JLab 12 GeV was recently completed. The future JLab 22 GeV upgrade will offer a new opportunity to perform the Primakoff experiments off an atomic-electron target with experimental sensitivities not previously achievable. The status of this program and its physics impact will be presented.

Parallel Session

Fundamental Symmetries / New Physics Searches

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Session Classification: Symmetries and New Physics