国立研究開発法人理化学研究所　仁科加速器科学研究センター
第320回 RIBF核物理セミナー
RIKEN Nishina Center for Accelerator Based Science
The 320th RIBF Nuclear Physics Seminar

レーザー電場によるサブ相対論的電子のアト秒制御
Attosecond control of sub-relativistic electrons with laser electric fields

Dr. Yuya Morimoto
(Ultrashort Electron Beam Science RIKEN Hakubi Research Team)

It is a dream for chemists to take snapshots of electrons moving in a material on attosecond (1 attosecond = 10-18 second) timescale because the electrons' motion is closely related to the mechanism of chemical reactions and material's optical properties. Sub-relativistic electron beams are widely used for sub-nanometer imaging such as in electron microscopes, and ultrafast processes can be filmed by using pulsed electron beams. However, the temporal resolution had been limited to sub-picoseconds due to available electron-pulse durations.

Recently, we developed a technology to temporally compress sub-relativistic electron beams down to attosecond durations. Electron beams were bunched by an electric field of a laser pulse and the bunch durations were measured via streaking induced by another laser pulse. In this talk, I will introduce the mechanism and examples of the attosecond bunching and discuss potential applications of the attosecond electron beams to chemistry, material science, nano-photonics, and accelerator physics.

May 16th (Tue), 2023　13：30 ～
via Zoom Meeting System

＊ The talk will be given in English language.

Contact: Nuclear Physics Seminar Organizing Committee
npsoc@ribf.riken.jp
http://ribf.riken.jp/~seminar/