51st RAP Seminar

The 51st Seminar on RIKEN Center for Advanced Photonics

Language: Japanese

Date: **March 16 (Fri) 16:00 - 17:00, 2018**

Location: **W319, 3F, Cooperation Center, Wako Campus, RIKEN**

(理研 和光キャンパス 研究交流棟 3階会議室 W319)

Title: **Generating attosecond photon pulses from high-harmonic generation driven by a mid-infrared free electron laser**

中赤外自由電子レーザで駆動する高次高調波アト秒光源の提案

Speaker: **Dr. Ryoichi HAJIMA**

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Free-electron laser (FEL) is becoming a well-established light source complementary for atomic and molecular lasers. FEL facilities are now in operation in the world to provide coherent light pulses in a wide range of wavelengths from infrared to X-ray. However, attosecond pulse generation via high-harmonic generation (HHG) driven by FEL has never been studied seriously. This is because FEL is long believed not to produce a carrier-envelope-phase (CEP)-stabilized few-cycle pulse applicable to the attosecond pulse generation. We recently proposed a scheme to realize CEP-stable few-cycle pulses in a FEL oscillator, which can be immediately utilized for HHG. As FEL wavelength is tunable, we can conduct HHG experiments with a mid-infrared wavelength (> 4 um) to explore the efficient generation of attosecond X-ray (> 1 keV) pulses in the phase-matched regime. Operation of FEL oscillators at a high-repetition rate (> 10 MHz) with high-average power (> 1 kW) will also provide an opportunity to extend science output from attosecond pulses.

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