エクストリームフォトニクスセミナー

Extreme Photonics Seminar

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Location: Cooperation Center, 5F Meeting Room, W524
(研究交流棟5階会議室 W524)

Title: Enhanced non-linear double excitation of He in intense EUV laser fields

Speaker: **菱川 明栄 教授** （名古屋大学）
Prof. Akiyoshi Hishikawa (Nagoya University)

Multiphoton ionization is a typical non-linear response of atoms and molecules exposed to intense laser fields. In contrast to the infrared or visible regime where the valence electrons are of primary importance for the response, a number of different pathways are open in EUV/X-ray laser fields, because electrons can participate in the ionization from both the valence and the inner-shell levels due to the high photon energy. Here we present non-linear, three-photon double excitation of He in intense extreme ultraviolet (EUV) free-electron laser fields (~24.1 eV, ~5 TW/cm2). Resonances to the doubly excited states converging to the He+ N = 3 level are revealed by the shot-by-shot photoelectron spectroscopy and identified by theoretical calculations based on the time-dependent Schrödinger equation for the two-electron atom under a laser field. It is shown that the three-photon double excitation is enhanced by intermediate Rydberg states below the first ionization threshold, giving a greater contribution to the photo-ionization yields than two-photon process by more than one-order of magnitude.

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