

エクストリームフォトンクスセミナー

Extreme Photonics Seminar



日時: 平成20年6月12日(木)
16:00 ~ 18:00, June 12 (Thu.), 2008

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

題目: フェムト秒レーザーパルスによる材料内部加工の特徴
Characteristics of material inside processing by femtosecond laser pulses

講師: 三浦 清貴 准教授 (京都大学)

要旨: ポンプ・プローブ法を用いた観測により明らかとなった、材料内部のフェムト秒レーザー照射による構造改質や微細加工の特徴について、圧力波や熱蓄積の効果を中心に述べる。加えて、透明材料内部の構造改質や金属の微細加工についても、それらの応用検討を交えながら幾つかの例について紹介する。

題目: Intact Molecular Ion Formation and Multiphoton Absorption in High Intensity Laser Fields

講師: 中島 信昭 教授 (大阪市立大学)

要旨: The first part of this talk is about ionization and fragmentation of organic molecules in the gas phase induced by intense femtosecond pulses from the perspective of intact molecular ion formation. Excitation parameters affecting fragmentation processes of excitation wavelengths, pulse durations, and polarization were changed at fixed laser conditions (typically 0.8 μm and 10^{13-14} Wcm^{-2} with durations of several tens of femtoseconds). Intact molecular ions are produced when the wavelengths are non-resonant with the electronic levels of the cations. A short enough pulse leads to the formation of fragment-free ions. In the case of anthracene, linear polarization was better for avoiding fragmentation. Time-of-flight spectra of femtosecond pulse ionization of cyclohexadiene isomers, 2,3-dimethyl-1,3-butadiene, anthracene, dioxin, and alkylphenol will be presented. The second part is some non-linear phenomena in solution and on a solid surface. Fluorescence from anthracene, tryptophan, etc. in solution was observed by irradiating infrared (1.3-2.0 μm) femtosecond pulses, indicating that five to eight photons were simultaneously absorbed. C_{60} on a glass surface was ionized to C_{60}^{+} without multiply charged C_{60}^{n+} ($n \geq 2$). Reduction from Eu^{3+} to Eu^{2+} in solution involving non-linear processes was observed.

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