

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11月20日(木)
16:00 ~ 18:00, Nov. 20 (Thu.), 2008

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

題目: 原子間力顕微鏡を用いたフェムト秒レーザーマイクロ津波が
細胞に及ぼす力学作用の評価

*Kinetic Interaction of Femtosecond Laser Micro "Tsunami" with Single Animal Cells
Estimated by Utilizing an Atomic Force Microscope*

講師: 細川 陽一郎 氏 (奈良先端科学技術大学院大学 特任准教授)

Prof. Yoichiroh Hosokawa, Research Associate Professor, Nara Institute of Science and Technology (NAIST)

要旨: When an intense femtosecond laser pulse is focused in a cell culture medium through an objective lens, a transient stress is generated and propagated from the laser focal point after shockwave and cavitation bubble generations. We have applied the transient stress, which we named femtosecond laser micro "Tsunami", to individual manipulation of cultured animal cells. In order to establish this application in biotechnology, it is indispensable to confirm the kinetics interaction of the "Tsunami" with single animal cell. In this work, we developed a force measurement system utilizing an atomic force microscope (AFM) to measure the "Tsunami" with spatial resolution of a few tens μm . The force of the "Tsunami" due to the cavitation bubble generation and collapse was estimated to be an order of μN . On the basis of the laser pulse energy dependence and spatial dependence of the AFM tip, the kinetic interaction with animal cells was discussed.

題目: ナノスケール光学: 表面プラズモンポラリトンの
フェムト秒ダイナミクス

Optics at nano-scale: Femtosecond dynamics of surface plasmon polaritons

講師: 久保 敦 氏 (筑波大学大学院数理物質科学研究科 助教)

Dr. Atsushi Kubo, Research Associate, University of Tsukuba

要旨: 'Plasmonics' has been proposed for the sake of achieving more powerful and integrated electronic devices. In such 'plasmonic' devices, digital information is carried by wave packets of "surface plasmon polaritons". "Surface plasmon polariton (SPP)" is a density fluctuation of electrons which can propagate along a metal-dielectric interface. SPPs possess a great advantage in terms of a downsizing of devices because the minimum volumes of SPPs are not restricted by the diffraction limits. In this seminar, I will talk about time-resolved movies of SPP wave packets in nano- and microscopic optics. A time-resolved photoemission electron microscopy (TR-PEEM) reveals the SPP dynamics with nanometer spatial and femtosecond time resolutions.

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