

Patrick Ferrand

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Objet: Séminaire "Optique et Applications" | Ven 20 Juin | Jérôme Mertz | New approaches for out-of-focus background suppression

RAPPEL

ATTENTION JOUR INHABITUEL (VENDREDI)

Vendredi 20 Juin 2008, amphi Rouard, bâtiment Fresnel, DU St Jérôme, accueil et discussion dès 13:30 autour d'un café, puis à 14:00:

"New approaches for out-of-focus background suppression"

par Jérôme Mertz
Boston University, Boston, MA

Abstract :

High resolution optical imaging in thick tissue remains a challenge. When light propagates in tissue it becomes scattered or absorbed, causing background and image distortion that increase in severity with imaging depth. Well-established techniques to reject background include confocal and two-photon microscopy, both of which involve beam scanning.

Recently, alternative 3D fluorescence imaging approaches have been developed that eliminate the need for scanning. These techniques involve illumination with highly contrasted structured light. By acquiring a series of fluorescence images with modified structured-light patterns, out-of-focus background can be suppressed numerically. I will discuss various strategies involving different structured light patterns, including grid patterns produced by a lamp and speckle patterns produced by a laser. These patterns have advantages and disadvantages, depending on the application.

Alternative techniques have also emerged to suppress out-of-focus background in laser scanning applications such as two-photon microscopy. For example, adaptive optics can be implemented by inserting a deformable mirror in the illumination light path. I will discuss a novel technique for suppressing out-of-focus background which involves introducing modulated aberrations in the illumination light path of a two-photon microscope. By toggling the aberrations on and off with a deformable mirror, a simple two-image algorithm leads to background suppression.

Venez nombreux !

L'équipe des séminaires "Optique et Applications"

Anne Sentenac, Patrick Ferrand (Institut Fresnel)
Caroline Champenois (PIIM)
<http://www.fresnel.fr/animation-scientifique/index.php>