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# Nouvelles approches en microscopie super-résolue pour la biologie

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Super-resolution microscopy has become a key tool in biology. However, the anisotropy of the localization between the lateral and axial precisions as well as their strong axial dependence, along with axial drift and chromatic aberrations may restrict the potential applications. We are currently developing two strategies to address these issues that use directly intrinsic properties of the fluorescent molecule itself. A first approach is based on supercritical angle fluorescence (SAF) emission, which corresponds to the fluorophores' near-field emission coupled into propagative waves at the sample/coverslip interface. This SAF information provides an absolute axial measurement of the fluorophore position, which can be combined to a complementary PSF shaping approach. This technique, provides 3D absolute information over a 1-µm capture range above the glass coverslip and an axial localization precision down to 15 nm with minimal loss of lateral resolution and little sensitivity to field aberrations. DAISY is ideally suited for multicolor imaging as it provides drift-free and chromatism-insensitive data over the whole imaging range.
The second approach is a new localization strategy called ModLoc. The position of a fluorescent molecule within a moving fringe pattern is encoded in the phase of its modulated emission signal. This permit to enhance the localization precision compare to classical Gaussian fitting, and to improve the localization precision.

## Choix de session parallèle

3.4 SFO et PSV: Photonique et science du vivant

**Primary author:** LÉVÊQUE-FORT, Sandrine

**Presenter:** LÉVÊQUE-FORT, Sandrine

**Session Classification:** Séance Parallèle