FLUORESCENCE LIFETIME CORRELATION SPECTROSCOPY (FLCS).
A POWERFUL TOOL TO MEASURE CONCENTRATIONS AND MOLECULAR INTERACTIONS

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Fluorescence Correlation Spectroscopy has become a standard tool in biophysics to study diffusion properties and molecular interactions in solution. In recent time it is used more frequently also in complex environments like cells and multi-label applications. Common problems complicating these experiments include detector afterpulsing and spectral crosstalk. Looking at the nanosecond arrival time of the detected photons after pulsed excitation can, in a straightforward way, identify artifact signals and help to distinguish and separate photons coming from species with different emission lifetime properties.

Using a pulsed 485 nm diode laser and a freely triggerable pulsed 560 nm laser – based on fiber amplification and gain switching – pulsed interleaved excitation (PIE) in combination with a simple photon filtering allows for an even simpler and more precise analysis of cross-correlation measurements.

We will present an universal approach on how to use the fluorescence lifetime information to improve and extend Fluorescence Correlation Spectroscopy, especially in order to simplify cross-correlation measurements.