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Multimodal nonlinear optical microscopy with shaped pulses

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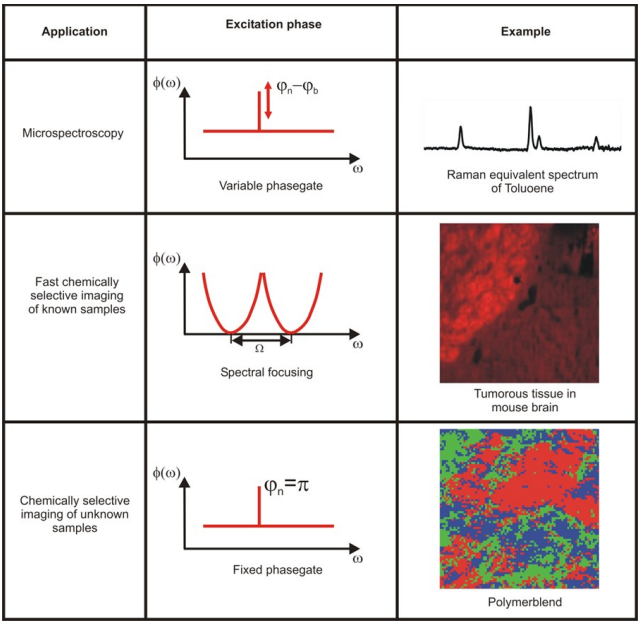
We demonstrate the use of shaped 10 fs pulses for single-beam multimodal nonlinear optical micro-spectroscopy. The combination of a broadband oscillator and a pulse shaper provides a flexible light source that can be optimized for various nonlinear effects produced in the sample, either for signal intensity or selectivity. In the case of coherent anti-Stokes Raman scattering spectroscopy specific shaped pulses allow to switch between high spectral information and fast acquisition of microscopic images with chemical contrast. Furthermore, the suppression of unwanted signal contributions in CARS spectra as two-photon fluorescence can be easily achieved, as well as tailoring excitation phases with numerical methods.



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