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[905] Point spread function engineering for image scanning microscopy

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A confocal microscope equipped with a pixelated detector allows for taking images with high resolution and improved SNR. This concept has become known under the name Image Scanning Microscopy (ISM). ISM can be regarded a “multi-view” instrument, because each detector pixel provides an individual confocal image. We present the combination of ISM with generalized point spread function engineering in the sense that both, excitation and detection pupil phases can be arbitrarily modified via a spatial light modulator. We demonstrate two different application fields of this “engineered ISM”: acquiring 3D sample information and sensing color. For both we show how the recorded data can be processed using a maximum-likelihood joint deconvolution algorithm.

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