Pixel-reassignment in confocal Raman microscopy

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We present a simple modification of fiber-coupled confocal Raman scanning microscopes that provides high spatial resolution in conjunction with high light collection efficiency.

By replacing the single multi-mode collection fiber by a hexagonal lenslet array and matching fiber-bundle, we build a hyperspectral snapshot imager that enables the implementation of pixel-reassignment in confocal Raman microscopy.

We present results from an experimental implementation featuring seven collection fibers, which provides a lateral resolution improvement of about 30%. We believe that our implementation represents an attractive upgrade for existing confocal Raman microscopes that use multi-line detectors.

[1] C. Roider, M. Ritsch-Marte and A. Jesacher, “High-resolution confocal Raman microscopy using pixel reassignment “, Optics Letters, 41, 3825-3828 (2016)