Single-acquisition 2-D multifocal Raman spectroscopy using compressive sensing: *Supporting Information*

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Figure S1 | Parallel acquisition of Raman spectra of multiple polystyrene beads optically trapped in a 4×4 LTRS-array. (a) Bright-field images of twelve polystyrene beads (2 μ m in diameter) that were loaded into a 4×4 laser tweezers array. The scale bar is 10 μ m. (b-c) Raman scatterings appearing on the CCD chip in xy- and y-projection modes, respectively. (d) Intensity profile along the dashed line in (b). (e) Spectra extracted from the 1st to 4th spectral stripe shown in (b) (from top to bottom).



Figure S2 | Parallel acquisition of Raman spectra of multiple polystyrene beads adhered on a silicon coverslip. (a) Bright-field images of the polystyrene beads (1 μ m in diameter) randomly scattered on the coverslip. The scale bar is 10 μ m. (b) Raman scatterings of these beads appearing on the CCD chip. The individual beads were located by Matlab codes and appropriate voltages were applied on the pair of galvo-mirrors to steer the focused laser to target them in a time-sharing manner. The spectra were acquired in xy-projection mode and patterned on the CCD in a 6×4 array (only 3 spectra were positioned in the first row). (c) Intensity profile along the dashed line in (b). (d, e) Spectra extracted from the 1st to 6th spectral stripe shown in (b) (from top to bottom).



Figure S3 | Single-acquisition Raman imaging of multiple polystyrene beads. (a) Bright-field images of 4 polystyrene beads that were slightly defocused. The scale bar is 10 μ m. (b) Raman images of the 1602 cm⁻¹ band, which was generated using the area under the peak.