

Contrast enhancement in elastic scattering microscopy of 2D materials using Fourier-filtered detection

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Abstract

This work introduces Fourier space (back-focal plane) filtering to enhance the contrast in elastic scattering microscopy.

In contrast to conventional laser scanning confocal microscopy, where a point-like detector such as an avalanche photodiode (APD),

records the full angular range of the reflected light, Fourier space filtering exploits the angle dependent reflectivity of the 2D material.

The angle dependent reflectivity of a 2D material on glass exhibits distinct regions with higher and lower contrast when compared to the glass-air interface.

Restricting the detection to regions with largest contrast increases the signal to noise ratio (SNR) up to a value of 150 as compared to 15 obtained from a conventional APD measurement.