

Analysis of Coherent Photoluminescence by Fourier Space Imaging

Zehua Xu, Lucas Lafeta, Achim Hartschuh
LMU Munich, Munich, Germany

Abstract

Photoluminescence (PL) is typically considered an incoherent emission process, as spontaneously emitted photons lack phase correlation. However, recent studies show that at cryogenic temperatures, PL from transition metal dichalcogenide (TMD) heterostructures can exhibit surprisingly long spatial coherence. This phenomenon is of interest for both fundamental photonics and quantum optoelectronics. k-space imaging offers a powerful method to probe spatial coherence by analyzing PL emission patterns. Since coherence length in TMDs is temperature-dependent, systematic correlations between temperature and k-space patterns can be established.