# Luminescence in hexagonal boron nitride single layer: exciton-phonon coupling and the role of substrate

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**Abstract**

Hexagonal boron nitride (hBN) is a wide band gap material with both strong excitonic light emission in the ultraviolet and strong exciton-phonon coupling. Luminescence experiments performed on the recently synthesized monolayer form (m-hBN) present emission spectra that differ from oneanother, with some suggesting a coexistence between phonon-assisted and direct emission channels.Motivated by these results, we investigated the optical response of (m-hBN) using a new ab initio approach that takes into account the effects of atomic vibrations on the luminescence spectra. We found that the emission signal of m-hBN is strongly dependent on its interaction with the substrate, which changes the screening felt by the electrons. This explains the different spectra obtained on various substrates.

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