# Structural and optical characterisation of h-BN layers

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Hexagonal boron nitride is a wide band gap semiconductor (~ 6.5 eV), which meets a growing interest for graphene engineering. In particular electron mobility of graphene is shown to be preserved when it is supported by a h-BN film. We attempt to have a better comprehension of the optical and electronic properties of thin BN layers, in correlation with their structural properties and to better know how electronic properties of graphene can be impacted by underlying BN layers.

h-BN has been shown to display optical properties, governed, by strong Frenkel-type excitonic effects. In this work, we investigate by Cathodoluminescence the emission properties of hBN samples synthesized by three different processes (HPHT, PDCs and a commercial powder). We observe in CL the same features of the S series which reveals the intrinsic origin of these excitonic recombinations unlike the D series.

Besides, thin hBN layers have been obtained by mechanical exfoliation from small crystallites of a commercial powder and a single crystal. We performed CL measurements on several flakes with various thicknesses and observed a significant effect of the confinement on the luminescence of hBN. Indeed, CL spectra exhibit S series with different features depending on the hBN thickness. This strongly suggests that this signal (S series) could arise from distinct contributions that we will discuss.