

## Dephasing in Strongly Anisotropic Black Phosphorus

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Black phosphorus (bP) is a direct band gap semiconductor, which, thanks to its layered structure, can be exfoliated down to the monolayer. It attracted great interest for various properties, among which anisotropic transport, optical, and thermoelectric properties have been recently observed and related to the puckered structure of bP layers [1].

Here, we will present recent results obtained on few-layer bP. We'll show experimental observation of weak localization in a bP field effect transistor [2]. Weak localization (WL) is a quantum effect, related to coherent scattering at low temperatures. Using the Hikami-Larkin-Nagaoka model [3], the dephasing length  $L_\phi$  can be inferred from weak localization. Our study is performed for various gate voltages, in the hole-doped regime, at temperatures down to 250mK. The temperature dependence of  $L_\phi$  was also investigated. We will point out how the anisotropic structure of black phosphorus can play a crucial role also in quantum effects such as WL.

### References:

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