

Exotic properties of 2D materials: physics and real expectations for applications

Paolo Bondavalli

Thales Research and Technology, 1, Av Fresnel, Palaiseau, France

Paolo.bondavalli@thalesgroup.com

Abstract

The recent discoveries of exotic properties of 2D materials have opened the horizons for potential new applications that can finally project us in the Beyond CMOS realm. Indeed, 2D materials when discovered have been implemented in Moore's approach as in case of 2D used for transistors. This is not the right approach in order to achieve real advances in physics and in defining the implementation of the new roadmaps for new devices based on innovative concepts. In this contribution, we will analyse the main phenomena recently discovered such as magic angle, valleytronics and 2D topological insulators in order to understand which are the potential applications of these devices. We will analyse in a completely objective way which are the main potential implementations of these phenomena. We will perform a roadmap identifying the major turning point in each case. This analysis will allow to have a precise idea of what could be only a hype phenomenon and what could be a real game changer for specific applications.

References

[1] 2D Materials: And Their Exotic Properties (De Gruyter Stem) Planned Publication: July 4, 2022, ISBN: 9783110656329