

Wafer-scale integration of graphene for waveguide-integrated optoelectronics

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To make graphene realistically appealing for a number of optoelectronic applications a feasible way to scale-up high-quality material with bottom-up synthetic approaches has to be found. In this talk, I will present the deterministic synthesis via chemical vapor deposition (CVD) of single-crystal graphene matrixes which can be straightforwardly integrated on existing photonic platforms [1]. The electrical properties of this graphene single-crystals are shown to be comparable to those of the gold standard, exfoliated graphene [2,3]. High-performing photonic building blocks such as photodetectors and modulators fabricated with graphene matrixes will be presented [4,5]. An alternative approach to obtain wafer-scale high-quality graphene on the c-plane of Al₂O₃(0001) substrates with a metal-free CVD approach will be discussed as a potential pathway for the front-end-of-line (FEOL) integration of this material in photonics [6].

References

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