## Influence of SiC substrate modification on the growth of epitaxial graphene

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### Abstract
Graphene is a 2D crystal composed of a honeycomb lattice of carbon atoms which exhibits outstanding electronic properties, such as high carrier mobility and ballistic transport at room temperature [1, 2]. However, the absence of an affordable method for mass scale production and the lack of bandgap in graphene are major hurdles for its applications in the field of electronics. Atmospheric pressure graphitization of silicon carbide (SiC) at high temperatures [3] can be a competitive approach for producing wafer-size epitaxial graphene (EG). Major advantages compared with other methods [2, 4] are achieved, e.g. complementary metal–oxide–semiconductor (CMOS) technology compatibility, no need for transferring graphene onto another surface avoiding the potential damage during such processes, etc.
Recently novel strategies such as bottom-gated EG, based on nitrogen (N) implantation into a vanadium (V)-compensated SiC wafer processed via atmospheric graphitization, have shown promising results for graphene electronics [5, 6]. However, implantation processes can induce surface crystal damage and therefore drastically change the quality of the subsequent graphene layer growth. Here we study the influence of ion implantation and doping of SiC substrates on the EG growth prepared by silicon (Si) sublimation at high temperatures, by means of optical and Atomic Force Microscopy (AFM), as well as Raman spectroscopy.

### References
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### Figures

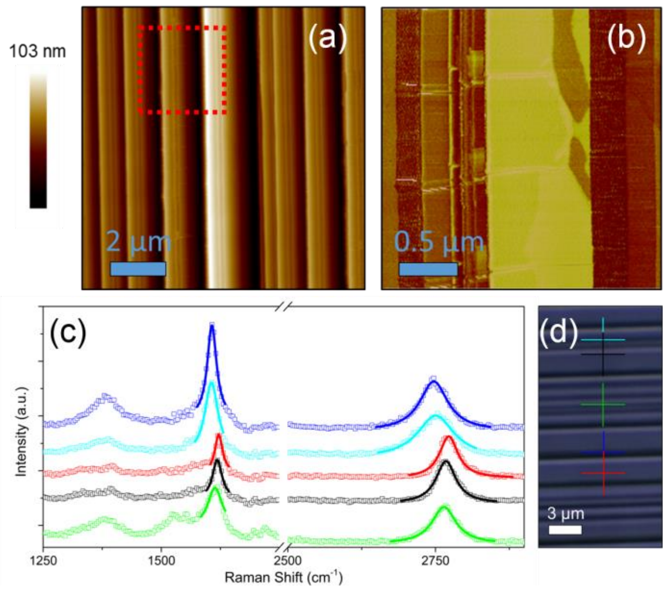


Figure caption: Results obtained after study of a vanadium doped SiC sample: (a) AFM topography image. (b) AFM phase image of the area inside the red dotted square in (a). (c) Raman Spectrum obtained at the points indicated in (d). (d) Optical image of the sample.