

Probe graphene plasmon polariton by use of Micro-FTIR

Supervisors: Sanshui Xiao and Niels Asger Mortensen

Project type: Any type of project

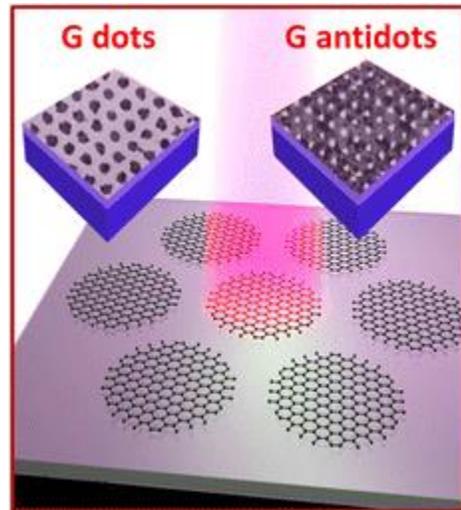
Project area: DTU Fotonik, Nanophotonics Cluster, SEM

Project description:

In the mid-infrared and terahertz region, graphene behaviors as a promising plasmonic material that is tunable and adjustable. The supported plasmonic mode is strongly localized near the graphene, and one of the questions is how to excite and probe the graphene plasmon. By taking the advantages of recently installed FTIR Microscope at DTU, in this project we aim to excite and probe graphene plasmon polaritons in the mid-infrared window, and the interaction between the graphene plasmon and phonon from the substrate will also be investigated.

In this project, your tasks could be focused on the following topics:

- Numerical evaluation of graphene-plasmon enhanced light-matter interaction
- Nanofabrication of graphene nanostructures
- Investigation of the excitation of graphene plasmon polaritons
- Investigation of coupling between graphene plasmon and substrate phonon



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References:

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- [2] X. Zhu, L. Shi, M.S. Schmidt, A. Boisen, O. Hansen, J. Zi, S.Xiao, and N. A. Mortensen, Enhanced light-matter interaction in graphene-coved gold nanovoid array, *Nano Lett.* 13, 4690 (2013).
- [3] X. Zhu, W. Wang, W. Yan, M.B. Larsen, P. Bøggild, T.G. Pedersen, S. Xiao, J. Zi, and N.A. Mortensen, Plasmon-phonon coupling in large-area graphene dot and antidot arrays fabricated by nanosphere lithography, *Nano. Lett.*, 14, 2907 (2014).