

## Optically induced absorption modulation in a graphene-based metasurface

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### Abstract:

Since its experimental realization in 2004 [1], graphene, a two-dimensional material made of carbon atoms arranged in a honeycomb lattice, has attracted enormous attention as a research topic as well as a material for commercial technological applications. A pronounced application, suitable for graphene exploitations, is that of thin film absorbers that are structures capable of absorbing all power of incident electromagnetic waves. Absorbers are used as non-reflective covering layers for shielding against electromagnetic radiation and minimization of backscattering from electromagnetic large structures. Recently, it has been demonstrated experimentally, that electrostatic gate-tunable perfect absorption in a simple structure consisting of an extended area of graphene placed over a grounded dielectric is possible in the THz regime [2]. In this work we demonstrate experimentally the ultrafast optically induced modulation of the THz absorption in this simple structure (graphene over a grounded dielectric).

[1] K. S. Novoselov, et al., *Science* 306, 606 (2004).

[2] N. Kakenov, et al., *ACS Photonics* 3, 1531 (2016).