Mehr Licht!
More Photonics for Intelligence

#E21

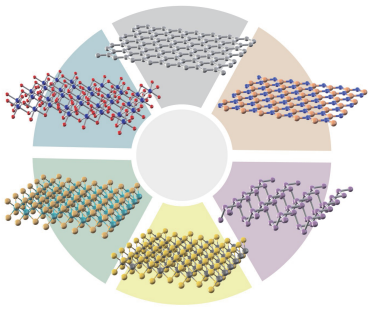
#AI & Quantum Infrastructure#Open Innovation

Novel-material Ultrafast Optoelectronics

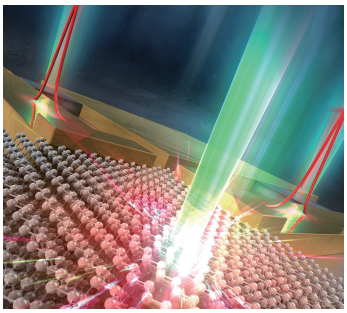
Beyond speed limits of electronics with atomically thin materials

Technical Challenges & Goals

While data traffic is growing, conventional semiconductor devices are approaching performance limits set by the intrinsic electron response in their materials. We aim to understand and optimize electron dynamics in emerging atomically thin materials to develop novel ultrafast devices based on new operation principles.



原子層物質による材料デザイン
Materials design enabled with 2D materials



サブピコ秒電流計測を実現する
独自THzエレクトロニクス技術
Unique THz electronics for
sub-picosecond current measurements

原子層物質にTHzエレクトロニクスを適用することで
既存半導体デバイスの動作速度限界を突破
Beyond device speed limits using THz electronics and 2D materials

Key Technologies

Core Technologies

- Exploring electron dynamics using our unique THz current generation and detection techniques
- Material design by tuning composition, layer number, and stacking of atomically thin materials

Key Differentiators

- Ultrafast zero-bias operation of a promising broadband graphene photodetector
- Propagation control of ultrashort graphene plasmon wave packets with 1.2-ps duration

Use Cases

Communication Services

We aim to understand electron dynamics in emerging materials and contribute to material and device design for ultrafast, broadband, and energy-efficient optoelectronic devices required for 6G and data centers.

Exhibitors

NTT Basic Research Laboratories

Related Links

https://group.ntt/jp/newsrelease/2022/09/12/220912a.html
https://group.ntt/jp/newsrelease/2024/07/22/240722a.html

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