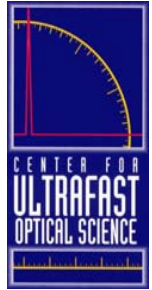


Ultrafast Relaxation of Hot Dirac Fermions in Epitaxial Graphene

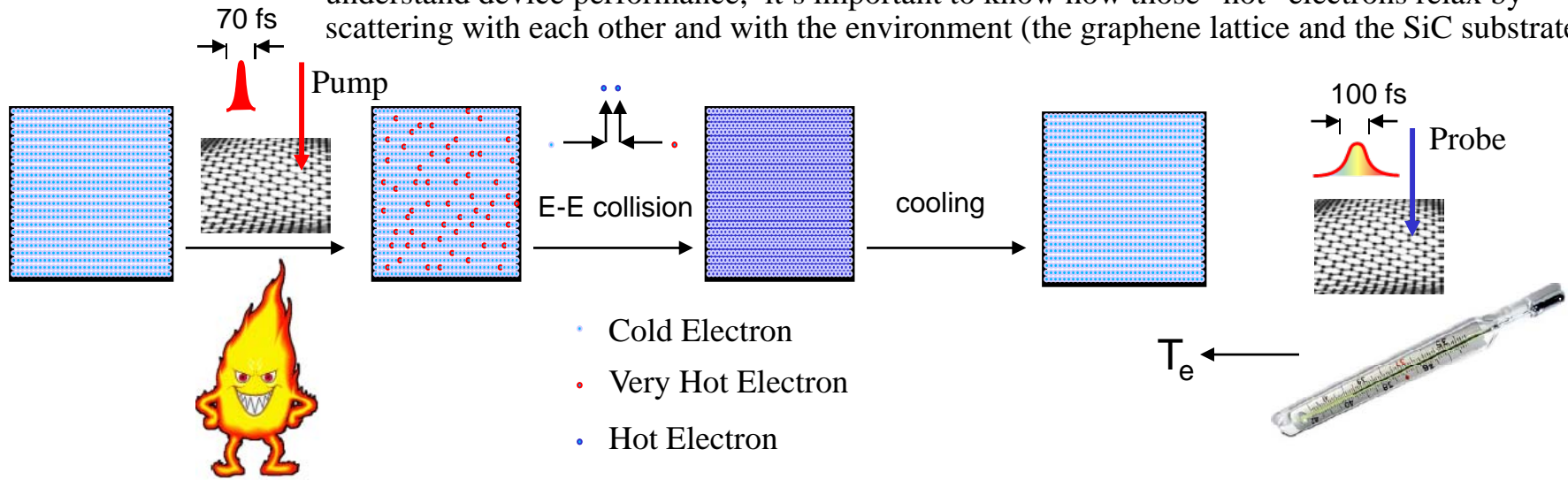


Dong Sun, Zong-Kwei Wu, Charles Divin and Theodore Norris
Center for Ultrafast Optical Science, University of Michigan

Xuebin Li, Claire Berger, W. A. de Heer, and P. N. First
School of Physics, Georgia Institute of Technology



In high speed devices, electrons are accelerated to high energy by a high electric field; to understand device performance, it's important to know how those "hot" electrons relax by scattering with each other and with the environment (the graphene lattice and the SiC substrate).



A short pulse can heat up the electrons; these electrons mimic those hot electrons in high speed electronics devices.

Those excited electrons transfer heat to each other by collision, and reach equilibrium within 30 fs.

Electrons release heat by collision with the lattice, until they lose all their heat.

With a short probe pulse at different colors, we can measure the electron temperature at different times with 100-femtosecond resolution.

“Interlayer Thermal Coupling of Hot Dirac Fermions in Epitaxial Graphene,” APS March Meeting, Pittsburg, PA (2009)

NSF Support: ECCS-0804908 and Georgia Tech MRSEC (DMR-0820382).