

Title: Plasmon damping in graphene

Graphene plasmonics has attracted lots of attention recent years, due to the tunability, low loss and strong energy confinement of the plasmons in graphene. In this talk, I'll focus on the damping mechanisms in graphene plasmons. For graphene plasmonic structure with size in the micron range, the major damping channel is due to the carrier Drude scattering in the bulk. With shrinking size of the structure down to 100nm range, the edge of the structure plays an important role. When the plasmon energy is greater than the graphene optical phonon energy, a new damping channel will be introduced. The plasmon can decay through the emission of an optical phonon together with an electron-hole pair. Of course, there are ways to reduce damping in graphene plasmons as well. I'll give two examples which show how the plasmon damping can be dramatically reduced.