



Femtosecond Luminescence From Metals and Semimetals

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ABSTRACT: Luminescence is a standard method to study the excited electronic states and their relaxation dynamics in solids, especially in insulators and semiconductors. However, the luminescence from metals and semimetals have rarely been studied. Several years ago, we found femtosecond infrared luminescence from some semimetals, such as graphite, bismuth, antimony and also from metallic states at the surface of topological insulators. We successfully obtained versatile information about the relaxation dynamics in these materials.

In addition, very recently, we discovered ultrafast infrared luminescence in many ordinary metals, Au, Ag, Cu, Pt, Al etc., when they have surface roughness. In this talk, I would like to propose the "femtosecond infrared luminescence" as a conventional tool for investigating the electron dynamics in metals, providing information similar to that could be obtained from time-resolved photoemission spectroscopy.