

Abstract Submitted  
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**Electron Excitation Dynamics of Molecules Induced by Optical Near-Field**<sup>1</sup> KATSUYUKI NOBUSADA, MASASHI NODA, Institute for Molecular Science — Optical response of molecules is undoubtedly essential for understanding their physicochemical properties. In conventional theoretical approaches to the optical response, far-field light and matter interaction has been discussed. However, recent advanced nano fabrication allows us to produce very precise nanostructures and optical response in a nanometer region plays a crucial role in developing functional materials. To understand the nano-optical response, we must explicitly treat the light-matter interaction, i.e., optical near field and matter interaction, occurred in a nanometer region. Very recently, we have developed an original TDDFT computational method with the aim of understanding optical-near-field excitation dynamics in nanostructures. Our computed results clearly show interesting phenomena that are completely absent in the conventional optical response under a dipole approximation. We will discuss some computed results of unusual electron excitation dynamics such as two-photon excitation and dissociation of molecules by an optical near field.

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