

Ultrafast magneto-acoustics and acousto-plasmonics

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Abstract

Ultrafast acoustic pulses have been proved to be excellent perturbation sources to explore dynamic properties of various materials such as metals, semiconductors, and insulators since their pure mechanical pressure changes the band structure of materials through modifying the lattice parameters. With this advantage, many efforts have been dedicated in combining acoustics with ultrafast magnetism demonstrating the precise control of magnetization (magneto-acoustics) and ultrafast plasmonics showing the extraordinary sensitivity (acousto-plasmonics). In this talk, I present how acoustic pulses are utilized in two different fields – ultrafast magnetism and plasmonics - and why they are promising excitation sources for future applications. Those results are in infancy now, however I believe that they are cornerstones for new perspectives of spintronic devices and ultrasensitive biosensors.