Fast X-Ray Stroboscopy Reveals Intracrystalline Deformation Caused by Laser Irradiation

The Coherent X-Ray Optics Laboratory, which has been making a great effort to "view the intracrystalline molecular motion," has established a new technology. It allows us to see the instantaneous structure of moving crystal thin films and semiconductor devices even when they are covered with opaque material.

When you feel sick, your doctor sometimes taps your chest with his fingers to make a diagnosis. In the same way, the new technology uses short laser pulses with the duration of one ten-trillionth of a second as a stimulus and Fast X-Ray Stroboscopy in the role of the stethoscope, to detect deformation in crystal materials.

We have applied this technology to semiconductors in practice, and successfully observed even the difference in motion of atoms caused by different rough surfaces. It is essential to know the deformation in materials, or the motion of atoms for the development of new materials and in advanced characterizations. The technology is expected to provide a new non-contact method to probe the internal features of materials.

The research results have been published in the March 24 issue of the American scientific magazine "Physical Review Letters".

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