Terahertz-controlling device is built

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U.S. government scientists say they've built a device that can manipulate terahertz radiation, perhaps leading to new imaging and communications devices.

The terahertz, or THz, range of the frequency spectrum lies between infrared and microwave wavelengths. Devices generating and detecting THz radiation are in development but techniques to control the waves are lagging.

But Hou-Tong Chen and colleagues at the Los Alamos National Laboratory have demonstrated metamaterials -- objects with properties based on their structure instead of the materials they are composed of -- can be designed to efficiently control THz waves in real time.

The researchers said they have built a device that consists of a semiconductor substrate with an array of gold structures on top. By controlling the voltage that is applied between the substrate and the metamaterial, the team can modulate the transmitted intensity up to 50 percent.

They said their demonstration exceeds the performance of existing electrical THz modulators and it's hoped the efficiency will be improved further by optimizing the device.

The experiment is detailed in the current issue of the journal Nature.