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Patent Number(s): US2012126122-A1

Title: High repetition rate THz generation system for emitting pulsed THz radiation, has radio frequency generator applying electric field to photoconductor through gold electrodes, where electrodes are insulated from photoconductor

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Abstract: NOVELTY - The system has an ultrafast optical pulse source generating a train ultrafast optical pulses, where the optical pulse source has a mode-locked diode laser (10) i.e. titanium doped sapphire laser, and a pump (5). A photoconductor (30) receives the optical pulses from the optical pulse source and generates a THz frequency pulse. A radio frequency generator applies an electric field to the photoconductor through a pair gold electrodes (63, 65), where the electrodes are insulated from the photoconductor and an electro-optic device i.e. zinc telluride crystal (45), is provided.

USE - High repetition rate THz generation system for emitting pulsed THz radiation by utilizing a radio frequency bias.

ADVANTAGE - The radio frequency generator applies the electric field to the photoconductor through electrodes, where the electrodes are insulated from the photoconductor, thus enhancing high voltage bias by using a resonant inductance-capacitance (LC) circuit. The system uses an oscillating bias for spreading a region high electric field over a wide area a sample so as to allow use a large laser spot, thus increasing pulse energy that can be used before performing an ultrafast screening process for a saturation purpose. The oscillating bias provides a larger region emissions in a radiated THz that is efficiently confined to forward direction than that an emitter incorporating a set trap-enhanced fields. The system is robust with lower voltage. The system is less susceptible to pickup from the oscillating bias. The system uses a resonant electronics for passively generating the high voltage without the need for a high voltage constant source. The system uses a simple electrode structure. The system does not require an electrical contact among the electrodes and the sample.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a THz generation method.

DESCRIPTION DRAWING(S) - The drawing shows a schematic block diagram a high repetition rate THz generation system.

Pump (5)

Mode-locked diode laser (10)

Photoconductor (30)

Zinc telluride crystal (45)

Gold electrodes (63, 65)

Drawing:

Derwent Class Code(s): J04 (Chemical/physical processes and apparatus including catalysis); L03 (Electro-(in)organic, chemical features electrical devices); V08 (Lasers and Masers)

Derwent Manual Code(s): J04-X; L03-H05; V08-A01B

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