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Patent Number(s): US2012193535-A1
Title: Method for characterizing e.g. laser-pulse-induced plasma with terahertz radiation by using terahertz wave enhanced fluorescence, involves detecting emission due to interaction of terahertz radiation with plasma to characterize plasma
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Abstract: NOVELTY - The method involves directing terahertz (THz) radiation (210) into plasma (100). Emission e.g. fluorescence emission and acoustic emission, due to interaction of the THz radiation with the plasma is detected to characterize the plasma. Characteristic of the plasma is determined by analyzing the detected emission. Variation in florescence is compared to variation of florescence of the plasma. The detected variation in florescence is fit to equation to characterize the plasma. The detected emission is compared with emission of known plasma.
USE - Method for characterizing plasma e.g. transient nature plasma such as laser-pulse-induced plasma and nitrogen/helium gas plasma, with radiation i.e. THz radiation, by using THz wave enhanced fluorescence from excited gas molecules/ions in THz time-domain spectroscopy used in field of science and technology.
ADVANTAGE - The method enables ensuring high temporal resolution and THz bandwidth coverage. The method enables maintaining picosecond temporal resolution and omni-directional optical signal collection that can circumvent limitation of the signal collection along forward direction.
DETAILED DESCRIPTION - The characteristic of the plasma is selected from a group consisting of plasma density, plasma scattering frequency, plasma relaxation time and plasma electron density. INDEPENDENT CLAIMS are also included for the following:
(1) a plasma characterizing device comprising a directing unit
(2) a plasma characterizing system comprising a gas cell.
DESCRIPTION OF DRAWING(S) - The drawing shows a schematic view of a plasma characterizing system.
Plasma (100)
Detector (106)
Plasma characterizing system (200)
Gas cell (202)
Gas inlet (204)
Radiation inlet (206)
Optic beam or pulse (208)
THz radiation (210)
Derwent Class Code(s): S03 (Scientific Instrumentation, photometry, calorimetry)
Derwent Manual Code(s): S03-E04D; S03-E08
IPC: G01J-005/10