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BIOLOGICAL MATERIAL
LASER PLASMA X-RAY POINT SOURCE

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INSTITUTE OF INTELLECTUAL PROPERTY RESEARCH & DEVELOPMENT
PROPOSED TECHNOLOGY

Technology relates to a Laser Produced Plasma System for X-ray generation. Particularly relates to targets coated with structured biological materials.

- Laser Plasma System comprising
  - A Laser producing source
  - A **Target comprising a biological material selected from cells of microbial, protozoan or plankton origin as a coating on a solid target forming a target system that absorbs intense laser pulses, generates hot dense plasma and results in the emission of X-Rays.**
  - System of optical elements for targeting the laser beam on target
  - Detectors and
  - Vacuum chamber containing the target system and system of optical elements.

PATENT STATUS

PCT Published Patent Pending Technology with number: **PCT/IN2009/000632**
ADVANTAGES OF PRESENT TECHNOLOGY

• Enhanced X-ray yield
• Target system preparation is easy and inexpensive
• Environmental friendly and non-toxic.
• Emission of radiation over a wide spectral range wavelengths down to 0.004 nm
• Plasma energy range of about 35 to 60 keV.
• Free from high z-metal debris.

APPLICATIONS / USES OF THE INVENTION

• Lithography
• Radiography
• Cancer Therapy
• Biological and material microscopy
• Imaging
• Non destructive testing among other applications.
Diagram Showing System and Target Material Arrangement

Target Arrangement ‘T’

Vacuum Chamber

Coating of biological material

Solid substrate
Plain glass/metal

Detectors

Optical Element

M1

Emissions

M2

M3

M4

Laser

Mirror

Mylar Window

Si-Ge

Glass Window

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11

12

6
AVAILABLE TARGETS AND THEIR DISADVANTAGES:

Different target materials/systems are used for the absorption of laser radiation and plasma generation

• Planar solid surfaces.
• Tape cartridges as targets.
• Frozen gases.
• Micro droplets of liquids
• Liquid metal among others.

Most of the above target systems have their own disadvantages as mentioned below

• Planar solid surfaces absorbs only a small fraction of incident light and scatters/reflects most of it.
• Most of the above mentioned targets are expensive.
• Requires sophisticated engineering and material processing method.
• Complicated design of vacuum systems to maintain required low pressures
• Use high z-metals which are not environmental friendly.
• Requires safe disposal systems
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