

Photoplasma Module



AI Overview

A photoplasma module is a device that generates reactive plasma using light and ions, used either for air purification or in scientific applications like isotope separation.

Air Purification Applications In air purification, a photoplasma module is part of advanced systems that actively neutralize contaminants. It generates a combination of negative ions, UV light, hydroxyl radicals, singlet oxygen, and low-level ozone to create a reactive plasma that disinfects air and surfaces at the molecular level. This technology can reach areas that conventional filters cannot, providing continuous sterilization and odor removal. Photoplasma modules are often integrated into HVAC systems or standalone purifiers, and they are designed to maintain ozone levels within safe limits for occupied spaces.

Scientific and Industrial Applications In scientific contexts, particularly Atomic Vapor Laser Isotope Separation (AVLIS), a photoplasma module refers to a plasma generated by photoionization of atomic vapors. Here, lasers selectively ionize specific isotopes, creating a photoplasma of ions and neutral atoms. These ions are then extracted using electrostatic or electromagnetic fields for isotope separation. The module typically includes the atom source, laser system, photoplasma region, and ion-extractor geometry, and is critical for achieving high enrichment factors in a single step.

Design and Functionality Photoplasma modules, whether for air purification or scientific use, share common principles:

- Generation of reactive species:** UV light or lasers excite atoms or molecules to form plasma.
- Ion and radical activity:** Negative ions and reactive oxygen species interact with contaminants or target atoms.
- Modular integration:** In air purifiers, modules can be detached or combined with other purification technologies like photocatalysts or ozone sterilizers.
- Continuous operation:** The plasma effect persists in the environment, providing ongoing purification or ion collection.
- Safety and Efficiency** For air purification, photoplasma...

Article Content

Expansion of a finite-size photoplasma in an electrostatic field with M ...

To understand this, let us consider a finite-size plasma placed between two parallel plates subjected to an external electrostatic field, in such a case near the electrodes there will be plasma

The Plasma Module User s Guide

The Plasma Module extends the functionality of the physics interfaces of the base package for COMSOL Multiphysics. The details of the physics interfaces and study types for the Plasma Module are listed

Ion-collection characteristics of photoplasma for atomic vapor laser ...

Estimates of ion-collection rates of the Indian AVLIS modules for lutetium-176 and ytterbium-176 were carried out. By invoking plasma physics, the technological aspect of producing enriched isotopes

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BIOSUN manufactures UV disinfection lamps, photoplasma purification modules and customized air disinfection solutions for home appliances, commercial buildings, public spaces and rail transit

Emission profile of the Ba 553.5 nm resonant line when Ba-HCL is...

Download scientific diagram | Emission profile of the Ba 553.5 nm resonant line when Ba-HCL is operated at 15 mA current. The red line represents the fitted Doppler profile. from publication ...

Review of the Latest Achievements on Atomic Vapor Laser

Laser Isotope Separation (LIS) of Lu-176 with a three-step selective photo-ionisation scheme is reported on a laboratory scale, which depends on the availability of directional neutral

Non-thermal plasma coupled with photocatalysis for indoor air

Advanced technology combining non-thermal plasma (NTP) with photocatalytic oxidation (PCO) for indoor air purification at high flow rates is tested on

Investigation on Ion extraction processes in M-Type

In this process, selective photoionized ions are extracted from the photoplasma by subjecting them to an external electrostatic field, using different

Ion extraction and charge exchange in laser isotope separation

The three kinds of particles (electrons, photo-ions, and ions created by charge exchange) are marked by different colors. The graphic outputs illustrate the motion of the electrons toward the anodes, the

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postmarketOS 26.06 is out with Alpine Linux 3.24, updated mobile desktops, systemd 261, Plymouth boot animation, and broader device support.

Ion-collection characteristics of photoplasma for atomic vapor laser ...

Article "Ion-collection characteristics of photoplasma for atomic vapor laser isotope separator module in electrostatic fields" Detailed information of the J-GLOBAL is an information service managed by the

2-D Simulation of Two-Chamber Photoplasma for Conversion of Light ...

This study was extended to have 2-D simulations using the Plasma Module in COMSOL for two-chamber cell configuration for Na-Ar mixture to study different plasma parameters .

Atomic Vapor Laser Isotope Separation

Ion-collection characteristics of photoplasma for atomic vapor laser isotope separator module in electrostatic fields A. Majumder A. K. Pulhani Physics, Engineering Physics of Plasmas 2024

REVIEW OF THE LATEST ACHIEVEMENTS ON ATOMIC VAPOR

A review of the recent literature on the atomic vapor laser isotope separation has been made, and it has revealed the ongoing activity and the focus of efforts within the community. The most popular

EMF Generation in Photoplasma Created by Concentrated Solar

In this article, an optimization study on the resonance photoplasma in Na-Ar mixtures has been conducted, ensuring spatial homogeneity of photoexcitation of res

Studies of Transient Photoplasma Evolution in an Electrostatic Field ...

A model of photo-ion collection in these electrostatic ion extractors was arrived at. Scaling of the initial photo-ion densities and the electric fields is crucial to photoplasma evolution spanning single-particle

Expansion of a finite-size photoplasma in an ...

To investigate the expansion of a finite-size photoplasma in an electrostatic field with parallel plate and M-type electrode configuration, a two-dimensional PIC code is specifically

Creation of resonance photoplasma by concentrated

The subject of the present research is a quantitative study of opportunity to obtain a photoplasma in a low pressure mixture of alkali metal

Model study of stationary quasi-homogeneous cesium-containing

The cesium photoplasma presents a different picture of main chemi-ionization processes compared to the sodium photoplasma (see further). It requires further development of the model for

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Discover how Photoplasma neutralizes bacteria, viruses, and VOCs to improve indoor air and surface safety in real time.

Ion-collection characteristics of photoplasma for atomic vapor laser ...

Understanding the physics and technology of processes, like atomic-beam generation, photoplasma production, and ion collection, is essential to designing any AVLIS module.

Optimization of Photoelectric Converter Based on a Two-Chamber

An optimization for the design of a two-chamber photoplasma has been carried out to investigate some parameters affecting the conversion of light radiation to electrical energy.

Contact Us

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