

PHOTON NEUTRALIZERS FOR NEUTRAL BEAM INJECTORS

Abstract

A non-resonance photo-neutralizer for negative ion-based neutral beam injectors. The non-resonance photo-neutralizer utilizes a nonresonant photon accumulation, wherein the path of a photon becomes tangled and trapped in a certain space region, i.e., the photon trap. The trap is preferably formed by two smooth mirror surfaces facing each other with at least one of the mirrors being concave. In its simplest form, the trap is elliptical. A confinement region is a region near a family of normals, which are common to both mirror surfaces. The photons with a sufficiently small angle of deviation from the nearest common normal are confined. Depending on specific conditions, the shape of the mirror surface may be one of spherical, elliptical, cylindrical, or toroidal geometry, or a combination thereof.

FIGURE 1