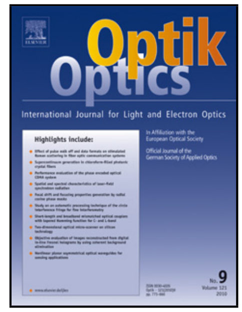
Accepted Manuscript



Title: How Ball Lightning manages to catch up a flying aircraft and penetrate into its salon

Authors: V.P. Torchigin, A.V. Torchigin

PII: S0030-4026(17)31020-3
DOI: http://dx.doi.org/10.1016/j.ijleo.2017.08.120
Reference: IJLEO 59583

To appear in:

Received date: 10-5-2017
Accepted date: 21-8-2017

How Ball Lightning manages to catch up a flying aircraft and penetrate into its salon

V. P. Torchigin, A.V. Torchigin

Institute of Informatics Problems, Federal Research Center “Computer Science and Control” of the Russian Academy of Sciences, Vavilova str., 44 build. 2, Moscow, 119333, Russia, tel +7 499 1332532, email: v_torchigin@mail.ru

Abstract

On assumption that a nature of Ball Lightning (BL) is optical one where no plasma is required and BL is a bubble of self-confined light, we show that optically induced forces that are negligibly small for the light of conventional intensity begin to play a decisive role at an interaction between the bubble and the terrestrial atmosphere. We show that these forces make it possible to detect a flying aircraft, catch up with it and enter the salon.

Keywords: ball lightning; optical space soliton; integrated optics; electrostriction pressure; optically induced forces.

1. Introduction

There are many reports on the observation of the appearance of ball lightning in flying aircrafts [1, 2]. The mix of cases, both new and historical, are collected in the top-secret report of Oak Ridge National Laboratories and presented in the Sagan book [3]. Unfortunately, the modern science is unable to explain this phenomenon. An inability to explain the phenomenon of the Ball Lightning is a shame of the physicists. They are studying this phenomenon for several centuries, above 200 hypothesis have been put forward, above 2000 publications have published but at present they can not explain even approximately abnormal properties and intriguing behavior of natural Ball Lightning. As quipped Sagan - author of the book entitled "Ball Lightning: Paradox of Physics". All theories have one thing in common - none work [3]. It frees us from the need to review and analyze the existing theories and enables us to concentrate on our approach.

In 2002 we put forward the theory in accordance with that the Ball Lightning (BL) is a pure optical phenomenon where no plasma is required. BL is a self-confined light (SCL). This term is not so senseless. For example, the known optical space soliton can be considered as a SCL where the plane light beam confines itself in one direction.

The light that confines itself in three dimensions can be imagined as a thin spherical layer of strongly compressed air where the intensive white light is circulating in all possible directions. The refractive index of the layer of compressed air is greater than that of the surrounding space