

Ball Lightning Generation on “Prometheus” Installation

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A ball lightning as a plasma system with magnetic field induction minimum in the center of its kernel is of an extreme interest for nuclear fusion. In a ball lightning generation area the intensive flows of fast ions can be obtained, the energy of which is sufficient to overcome Coulomb's potential barrier. The prior experiments made at “Prometheus” installation showed that a ball lightning generated at the initial pulse stage [1]. To increase energy transfer efficiency from capacity storage to a ball lightning on the basis of “Prometheus” installation a “Prometheus-2” installation was built. The storage parameters of a new installation are: charge - 0.4 Coulomb, charge voltage – 50 kV, stored energy – 10 kJ. The current in a discharge cell was equal 140 kA and a pulse duration was about 100 microseconds. In the course of experiments the following parameters were measured: voltage and current in a discharge cell, ball lightning potential by means of a probe and a divider, the collector current at ball lightning collapse. Microwave radiation in a discharge and bremsstrahlung generated were registered while a ball lightning was passing through absorbers. Ball lightning luminescence was registered optically by means of optoelectronic converters. It was discovered that a ball lightning passes not only through glass but also through plastic and metal sheets as well as a water layer 18 cm deep. Images of ball lightning for two interval of time are given on next Fig.1.

It should be noted that principally a dipole-type ball lightning may take place in Nature. It should consist of two spherical fields. One of the fields has an excess positive charge. Another field is an excess negative charge. Each of the fields rotates round its own

axis, and both axes rotate round their common center of masses. This system stability is achieved in the case when Coulomb's interaction force between the fields is balanced by a force caused by centripetal acceleration. A gigantic analog of such a structure in the Universe is double stars. Presence of electrical discharges on altitudes from 60 to 160 km from the Earth gives the warrants to consider that unidentified flying objects (UFO) are giant ball lightnings, which formed in such discharges at break-down. Generation of "red devil" in such discharge, was observed by Russian astronaut V.A.Dzhanibekov from space. Burnt roots of trees in the forest at river Tunguska in 1908 year at destruction and interaction of UFO with a surface, give the bases to consider, that the object contained electrical discharge.

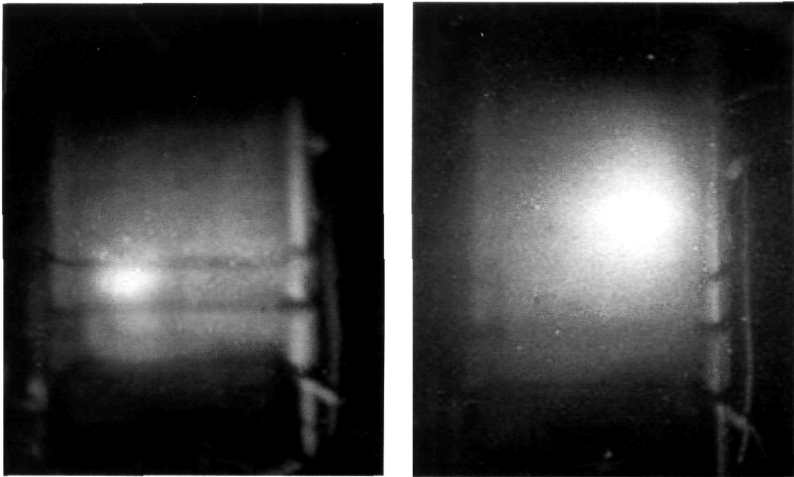


Fig.1 Images of ball lightning for two interval of time

1. A.G.Oreshko -*Research of a ball lightning and prospects of it's use for applied purposes*. VI Intern. Conf. Plasma Physics and Plasma Technology. Contributed papers. Vol.I. Minsk, Belarus, September 28 – October 2, 2009, p.137-140.(PPPT-VI).