



Contribution ID: 23

Type: **Poster Presentation**

GENERATION OF INTENSIVE DIRECTED CONTROLLED X-RAY RADIATION DURING CAVITATION OF FAST LIQUID STREAM

Friday, 8 July 2016 14:10 (20 minutes)

In the report the results of investigation of intensive directed controlled X-Ray radiation connected with bubble cavitation phenomena in fast oil jet and supersonic water jet [1] are presented and discussed. The total activity of X-Ray generation was about $Q \geq 0.1$ Ci.

The mechanism of X-Ray generation is connected with the sequential tandem of cavitation and shock-wave processes inside liquid jet and in the volume of output channel. We have investigated bubble cavitation and X-Ray generation phenomena at high pressures of machine oil ($P=30-90$ atm) and at super-high pressures of water ($P=200-2000$ atm). The soft part of X-Ray radiation ($E_x=0.8-1.1$ keV) was generated by the surface of supersonic free water jet in the area of cavitation at any pressure. The energy of radiation from the surface of oil or water output channel (made of plexiglas or stainless steel) was $E_x=1.5-2.0$ keV. In the case of additional lead cover on outer surface of a channel the energy of X-radiation was $E_x=4.5$ keV.

It was shown also that the formation of shock waves and X-rays is accompanied by generation of undamped high frequency thermal waves [2].

1. Vysotskii V.I., Kornilova A.A., Vasilenko A.O., Tomak, V.I. Journal of Surface Investigation X-ray, Synchrotron and Neutron Techniques, 2014, v.8, 1186.
2. Vysotskii V.I., Kornilova A.A. Current science, 2015, v.108, 114.

Primary author: Prof. VYSOTSKII, Vladimir (Kiev National Shevchenko Univ., Kiev, Ukraine)

Co-author: Dr KORNILOVA, Alla (Moscow state univ., Moscow, Russia)

Session Classification: Poster 3-A

Track Classification: Plasmas, Discharges, and Electromagnetic Phenomena