source of a high pressure plasma jet for plasma injection in GDT [[1]](#footnote-1)\*)

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For effective operation of axisymmetric open traps with a population of hot ions (with an energy of ~ 10 Kev), such as the gas Dynamic trap (GDL) and the GDML planned on its basis, it is necessary to maintain a population of relatively cold target plasma (with an energy of ~ several hundred eV). Without a target plasma, kinetic instabilities develop in the GDL [1], and it is also impossible to maintain electrical contact with the electrodes of the MHD instability suppression system necessary for the operation of this system[2]. Since the confinement of the target plasma occurs in a highly collisional mode, the loss cone in the phase space for the target plasma is always filled and the target plasma leaves the trap during the gas-dynamic time. Thus, without sufficient feeding of the target plasma population with a substance in open traps, stationary plasma confinement with thermonuclear parameters is impossible.

In this paper, we consider a plasma jet source for cross-injection of plasma into an open trap. For plasma to enter the trap when injected perpendicular to the magnetic field lines, the plasma jet pressure must be on the order of the trap's magnetic field pressure. This imposes requirements on the minimum specific energy of the plasma jet.

A jet of plasma is created and accelerated by a Marshall gun. This method has proven itself well on tokamaks [3], and has also been tested on open traps [4].

During the development of the source, it was modified several times. This paper presents the results of measuring the parameters of a plasma jet from a source with the following changes relative to the previous version:

1) Radial gas injection, which allowed to accelerate the rate of gas injection

2) the Ceramic insulator is located further from the gas inlet and is closed from the plasma by an external electrode.

References

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1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLVIII/Mu/ru/AX-Kolesnikov.docx) [↑](#footnote-ref-1)