

CS INJECTION INTO A DUOPLASMATRON

G. Lawrence

June 1973

Collider Accelerator Department
Brookhaven National Laboratory

U.S. Department of Energy

USDOE Office of Science (SC)

Notice: This technical note has been authored by employees of Brookhaven Science Associates, LLC under Contract No.AT(30-1)-16 with the U.S. Department of Energy. The publisher by accepting the technical note for publication acknowledges that the United States Government retains a non-exclusive, paid-up, irrevocable, world-wide license to publish or reproduce the published form of this technical note, or allow others to do so, for United States Government purposes.

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

Accelerator Department
BROOKHAVEN NATIONAL LABORATORY
Associated Universities, Inc.
Upton, New York

AGS DIVISION TECHNICAL NOTE

No. 104

G. Lawrence (LASL), T. Hayward (LASL),
K. Prelec, Th. Sluyters

June 6, 1973

CS INJECTION INTO A DUOPLASMATRON

An attempt was made to investigate the effect of cesium injection into the hollow discharge duoplasmatron in analogy with a very successful experiment by Dimov (Novosibirsk) in a cold cathode magnetron source.

On Saturday afternoon, a first attempt was made. The duoplasmatron operated in an hydrogen environment with an H^- output of one milliampere. We now slowly increased the temperature of the cesium cell and we observed clearly the growth of the H^- beam, doubling during the first minutes. As an interim test, we closed the valve of the cell and the intensity indeed reduced to half its value. After opening the valve again, voltages across the extractor gap could not be maintained. Probably the temperature in the cell increased enough to coat the cold, high voltage area with some cesium. Several attempts to repeat the above experiment failed.

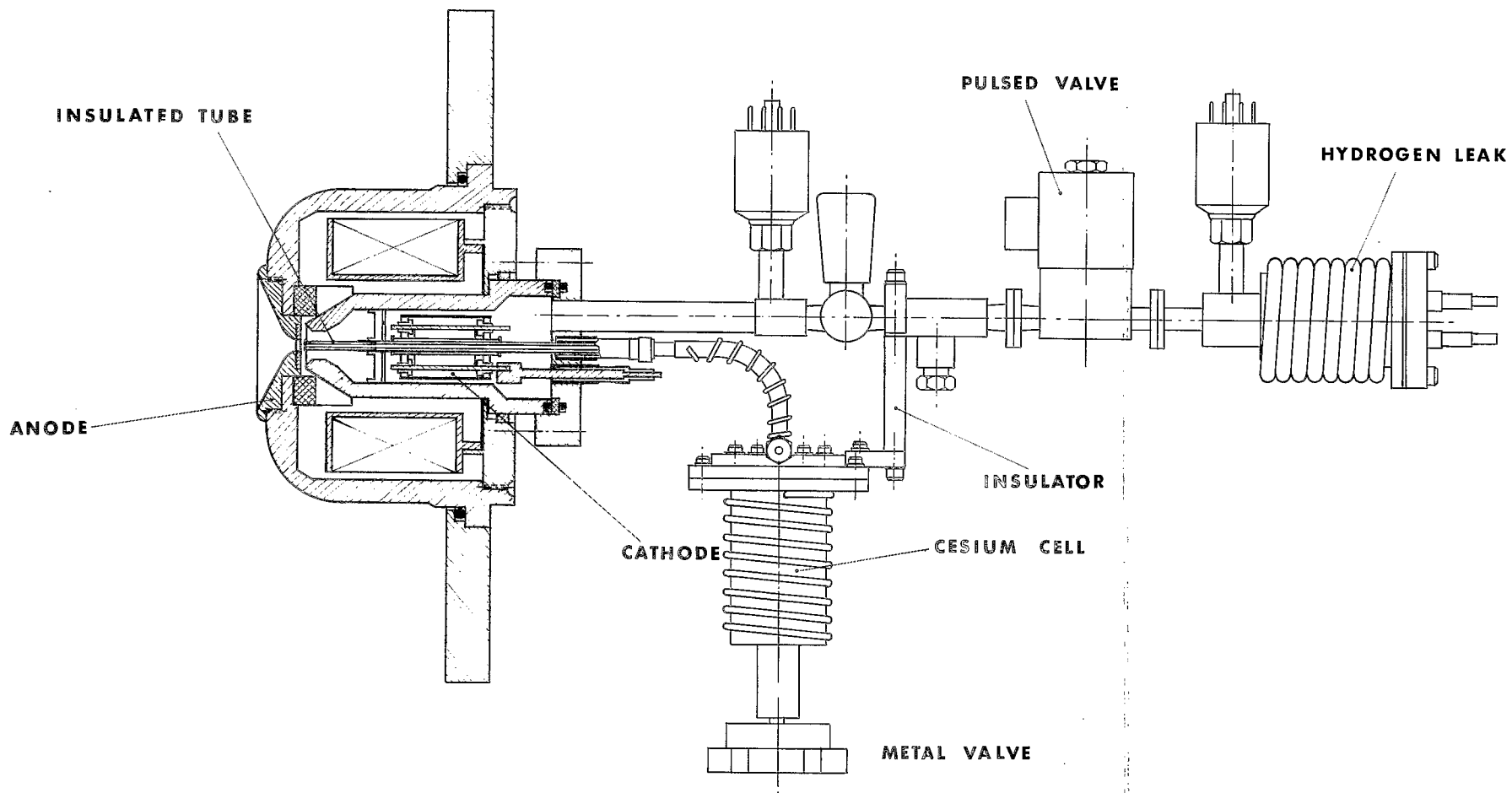
Though we have hoped to observe a more dramatic effect, the experiment suggests that under proper conditions Cs injection has to be further explored as a possible means to increase negative ion production. This experiment taught us the ground rules for direct Cs injection into any source.

We would like to thank Lou Repeta and his group, as well as the machine shop, for their instant help during this period. Contributions of our Ron Clipperton go beyond any evaluation.

Distr.: AGS Department Physicists
Department Administration

1 2 3 4 5 6 7 8 9 10 11 12

A B C D E F G H



DUOPLASMATRON WITH CESIUM CELL

NO. REQ.	ACCT. NO.	I.L.R. NO.	ORDER NO.	DEPT.	JOB NUMBER	USED ON DWG. NO.	NO. PER. ASSY.	
DEC. #	ANG. #	MAX.	MIN.	BROOKHAVEN NATIONAL LABORATORY ASSOCIATED UNIVERSITIES, INC. UPTON, N. Y. 11973				
TOLERANCE		BREAK SHARP EDGES						
0-20"	20"-60"	OVER 60"	FINISH	✓				
FRACTIONAL TOLERANCE								
DATE	MATERIAL	SCALE	WEIGHT					
DRAWN BY	CHECKED BY	ENG. APP.	SUPVR. APP.	DRAWING NUMBER				REV

REV.	ZONE	DESCRIPTION	BY	DATE	CHKR	APP
1						

-4-

-4-