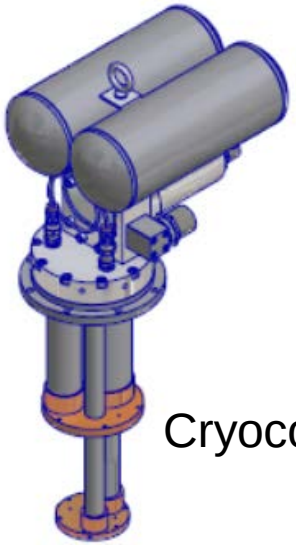
Status of the pellet target activity

M.Büscher, A.Gerasimov, V.Chernetsky, P.Fedorets, A.Dolgolenko, V.Balanutsa, P.Balanutsa, L.Gusev, S.Mineev, S.Podchasky, I.Tarasenko, V.Demekhin, S.Makagonov

Assembling of the second target prototype in ITEP

ITEP second pellet target

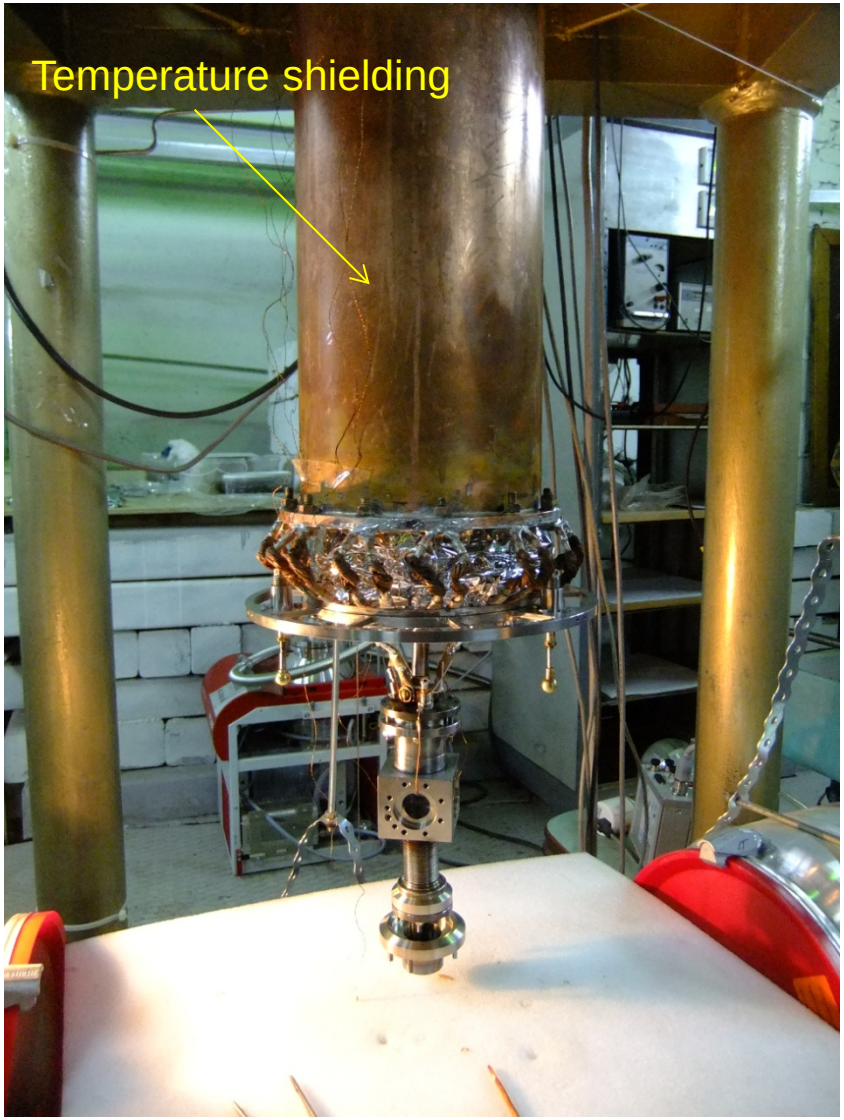
Test hall, April 2013

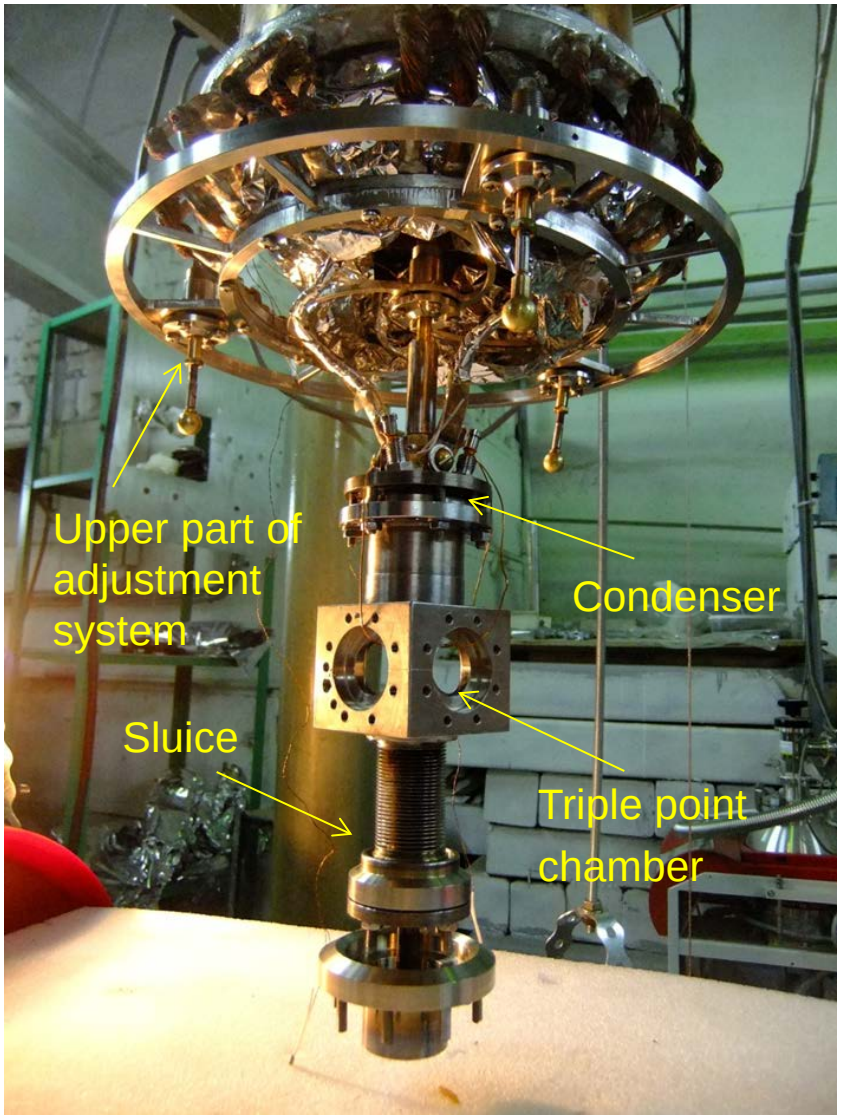


Cryocooler PT810

Assembling of the second target prototype in ITEP

Inner view of the target in ITEP, October 2014



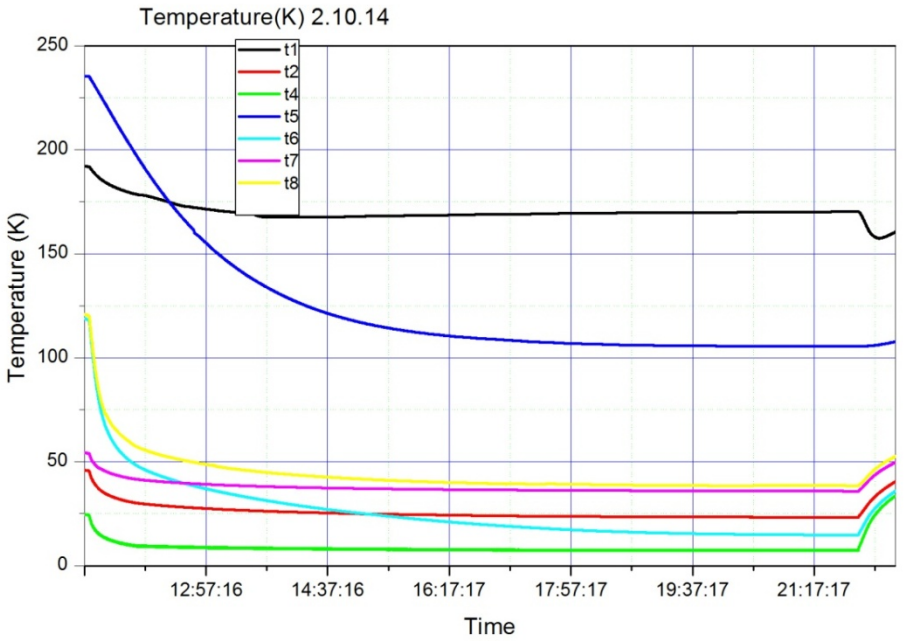


Most elements are installed. Regular low temperature test for optimization of temperature distributions.

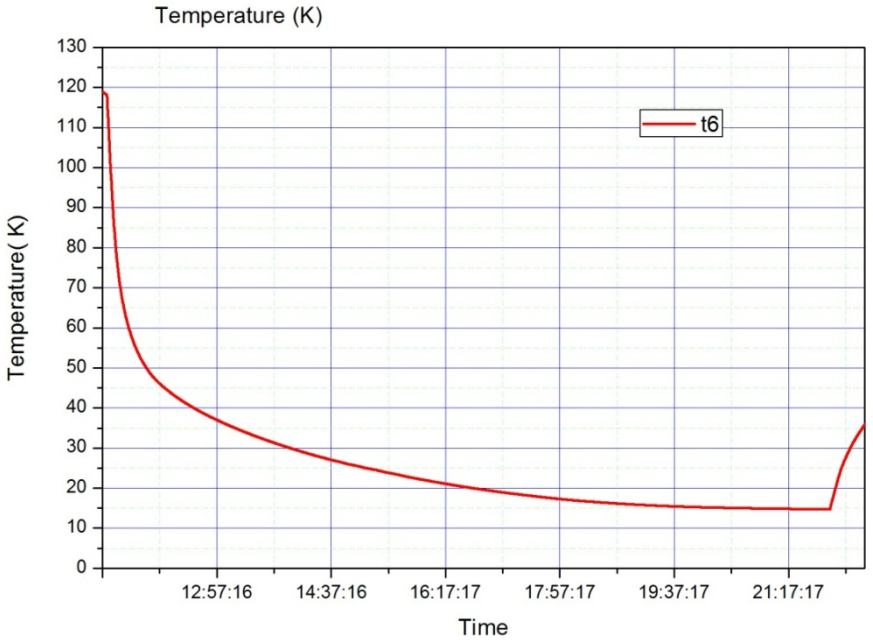
Low temperature tests in ITEP (example)

14 temperature sensors installed inside the target

Test on 2 of October (8 sensors example)



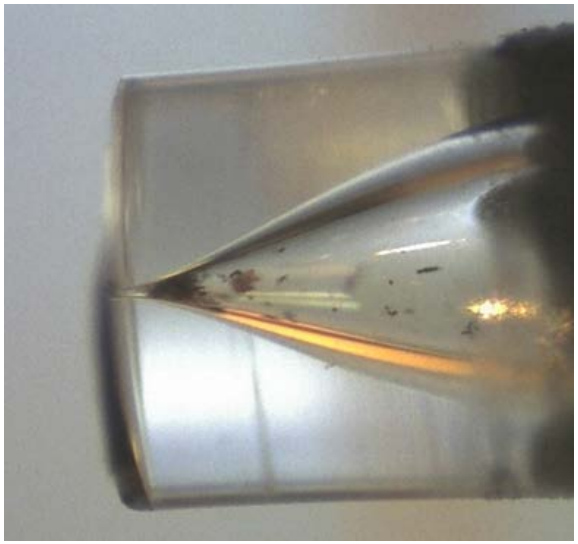
Sensor N6 – condenser



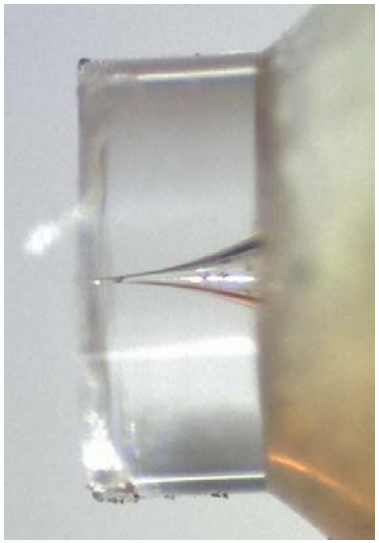
<u>Summary:</u> temperature 14.7 K was achieved on the condenser

Investigation of the nozzle blocking

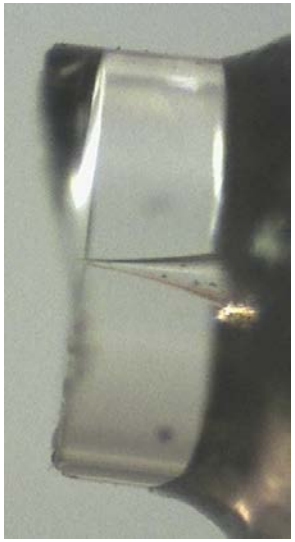
Stycast simple



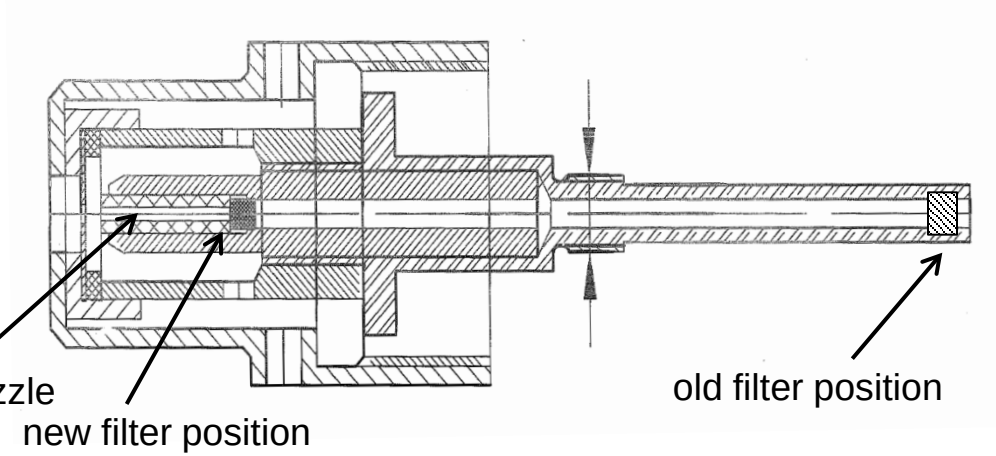
UHU + Boron nitride (BN) filler + vacuum



Stycast + BN filler + vacuum



New filter position



Investigation of the nozzle blocking

1) Using of updated technology of gluing improves the situation – longer operation and partial blocking only, but did not solve it completely. Last tests gave us impression that the blocking starts after switching on the generator. It should be verified.
2) Tests with alternative method of “blowing” the nozzle for decreasing the jet/pellet diameter up to now did not give the result.
3) Continue investigation of cleaning/protection procedures for nozzles. Further studies in two directions: reject of using glue (another methods of fixing glass nozzle) or installation of the protection filter after glue.

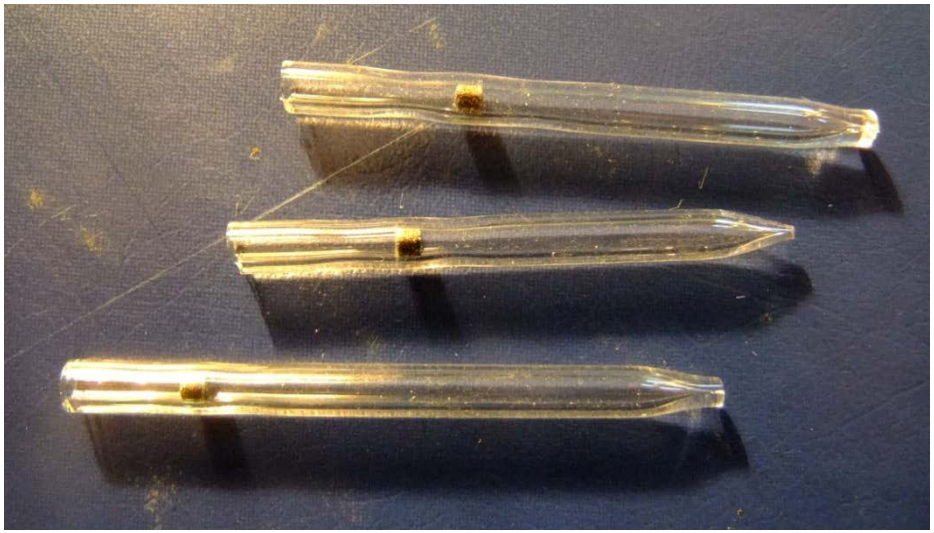
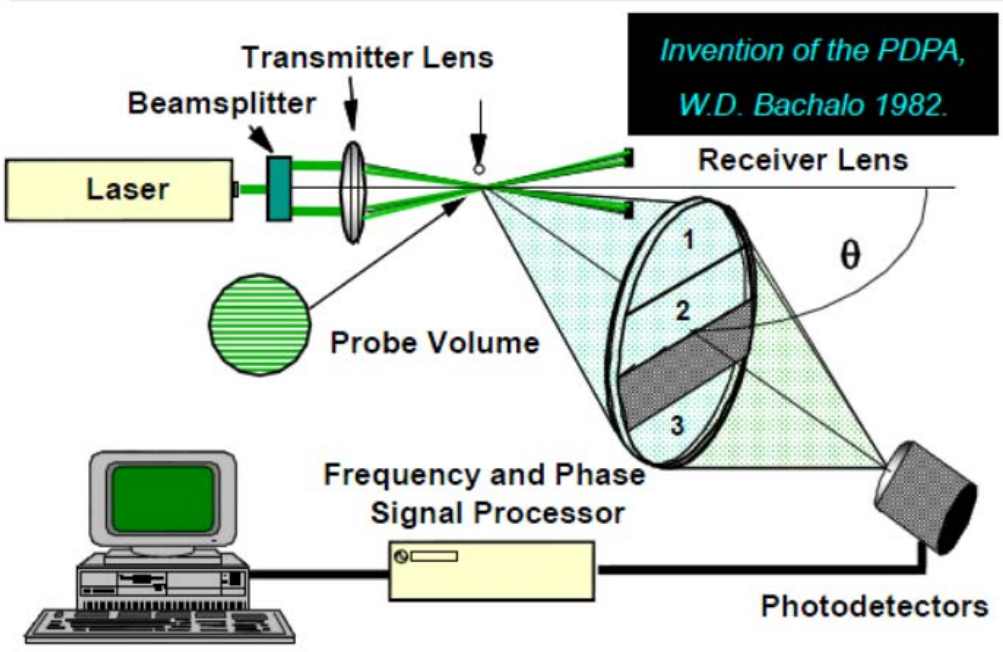


photo of the filters melted inside the nozzle (October 2014, ITEP)

Phase Doppler Interferometer

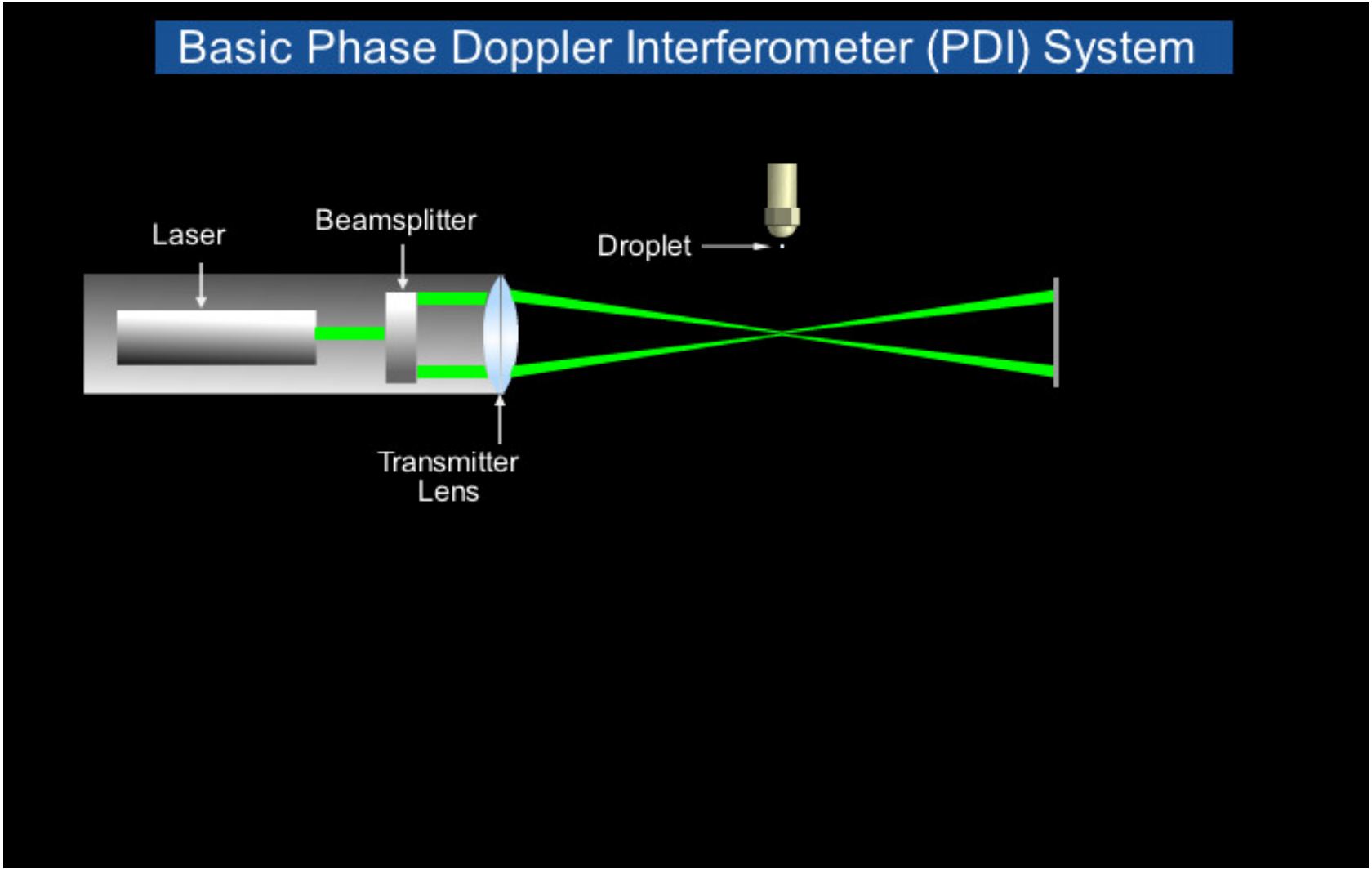


Goals: measurement of size and velocity of droplets/pellets

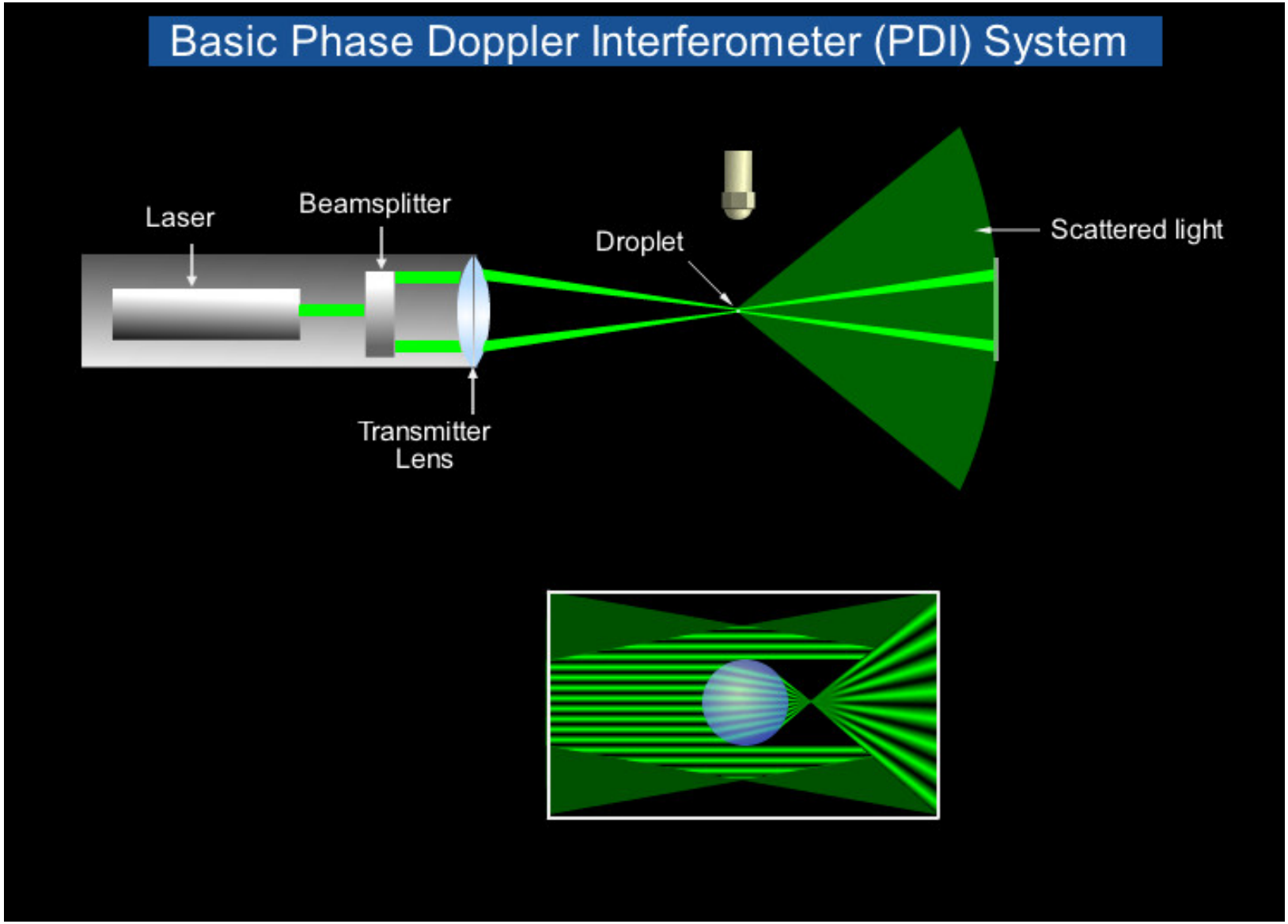
1 PhD student P.Balanutsa

Cooperation with National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

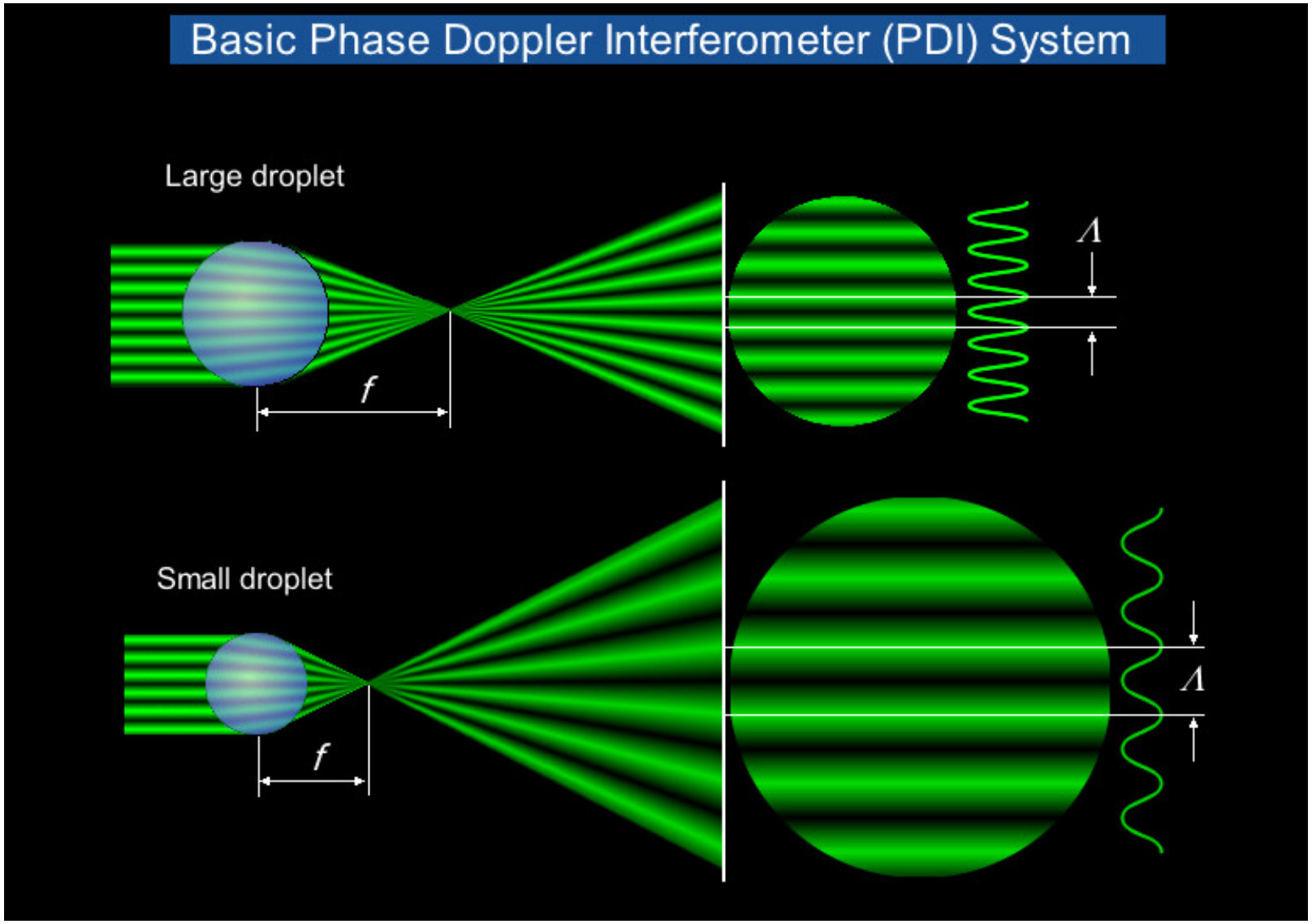
Phase Doppler Interferometer



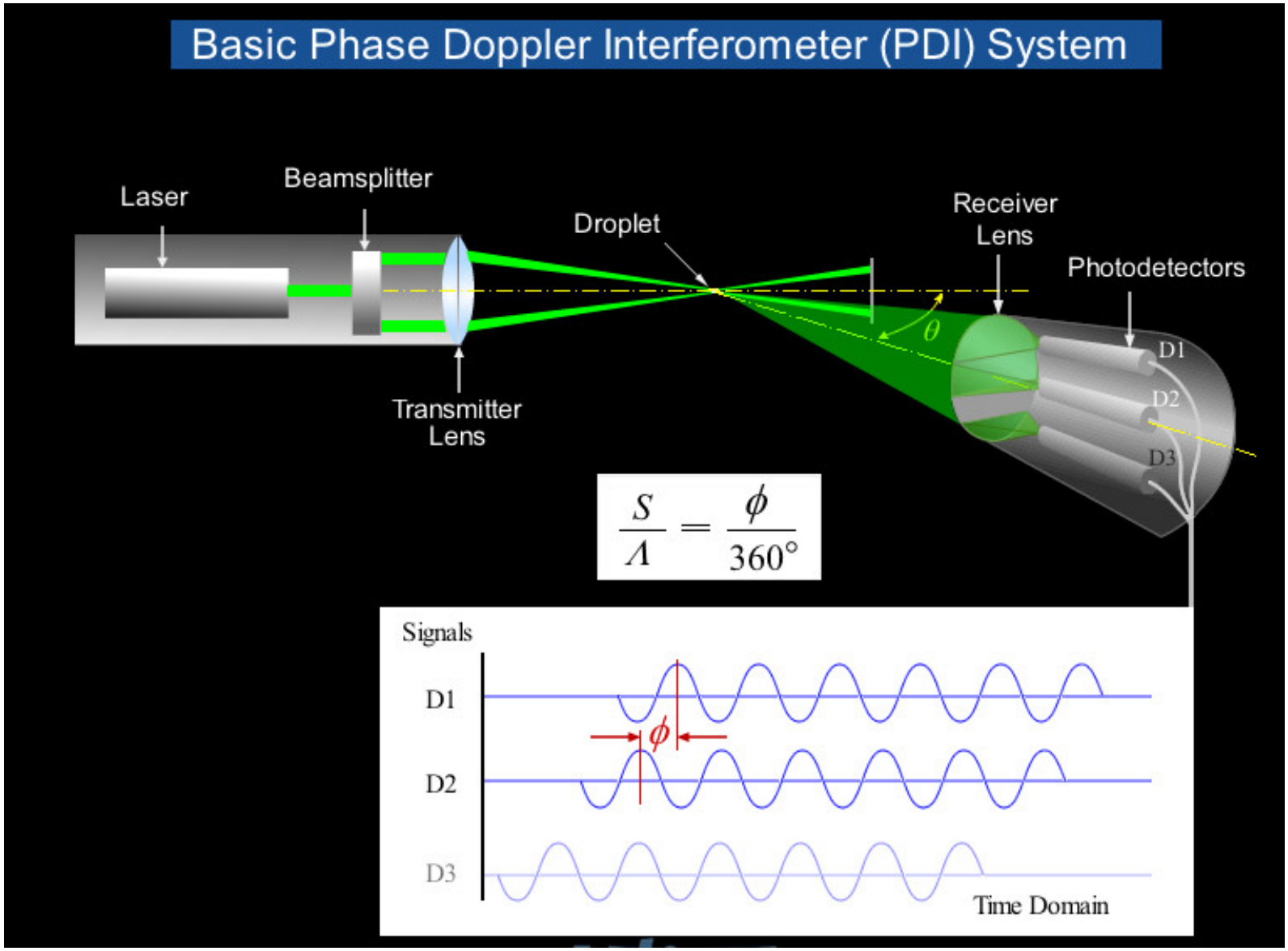
Phase Doppler Interferometer



Phase Doppler Interferometer

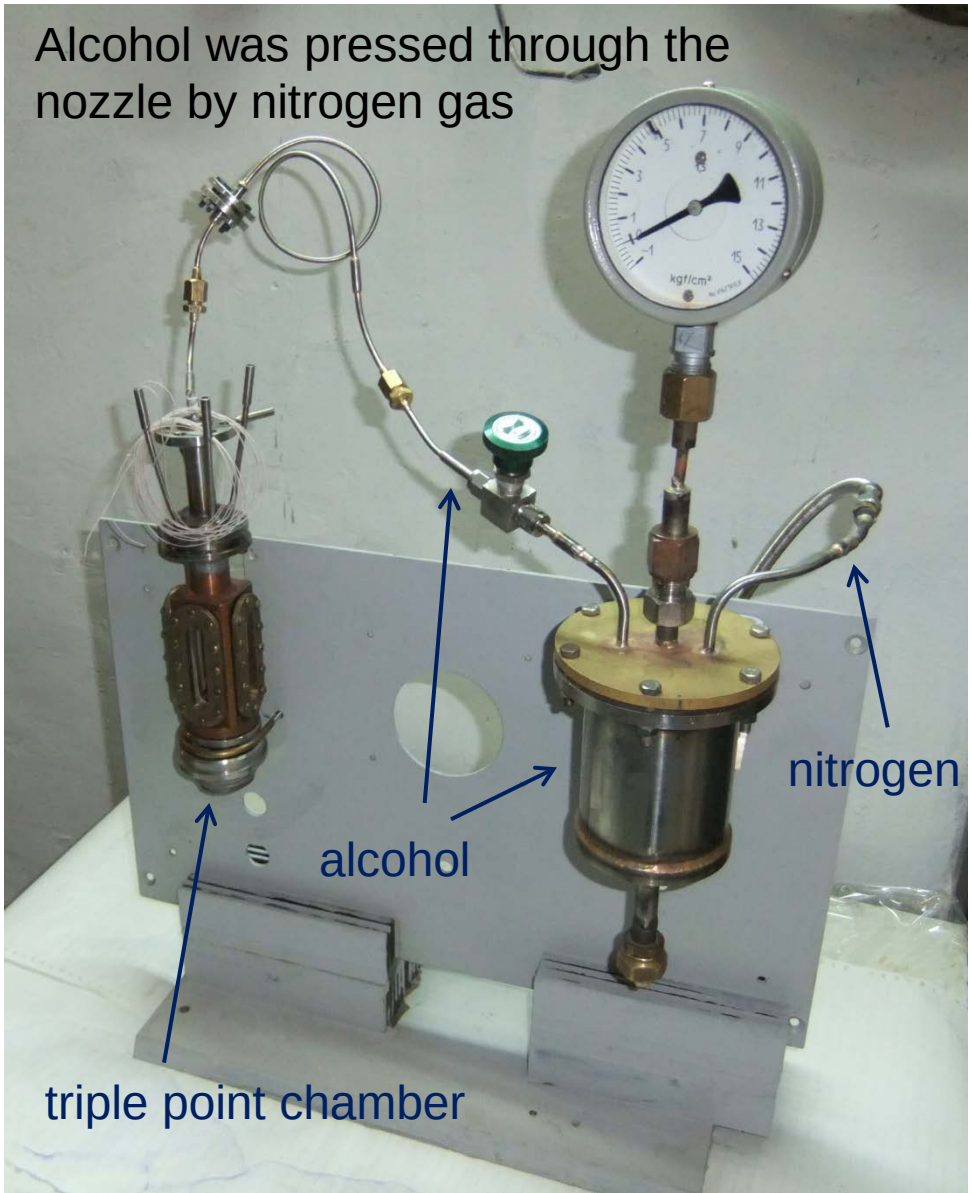


Phase Doppler Interferometer



Test place for Doppler interferometry method

Test station with distilled water or alcohol



Program of investigations:

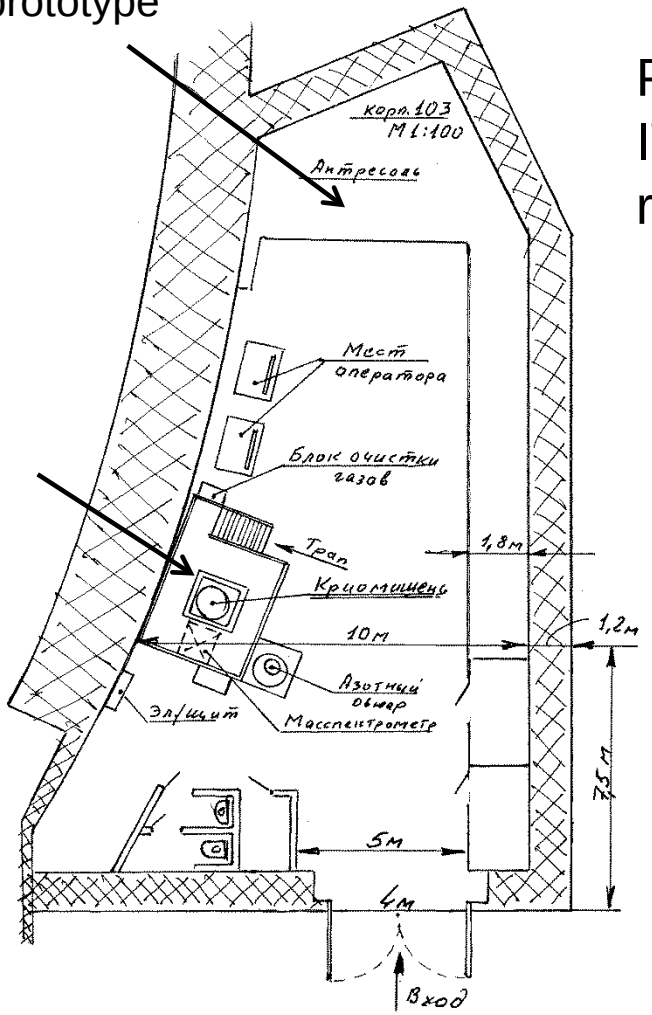
1. Preparation of lasers, collimators, getting the interference pattern (done)
2. Regime of jet production with alcohol (done)
3. Getting the monodisperse droplets with alcohol, control with CCD cameras
4. Observation of droplets with interferometry method, selection of parameters

Transfer of the first target prototype from FZJ to ITEP

Location of the targets in the test hall of ITEP

second target prototype

first target prototype from FZJ



Preparation of the place in ITEP for the target from FZJ, renovation work is going on

Activity of the Pellet target group in Q3-Q4 of 2014

Summary:

1) Assembling and tests of the second prototype of the target in ITEP
2) Investigations for improvement of the nozzle protection
3) Study and development of the method of Doppler interferometry
4) Preparations for the transfer of the first target prototype from FZJ to ITEP
5) Preparation of the place in ITEP for the target from FZJ
6) Disassembling and packing of the first target prototype in FZJ